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ABSTRACT

The volume of working papers includes eight papers describing current theory and research in linguistics and in semantics and syntax. The following articles are in the collection: "The Grammar of Emotive and Exclamatory Sentences in English," "Linguistics as Chemistry: The Substance Theory of Semantic Primes," "On Perceptual and Grammatical Constraints," "On Invited Inferences," "Remarks on Directionality" (concerning the relationships among various levels of grammatical description), "Evidence" (concerning the syntactic properties of verbs such as think, believe, assume, suppose, anticipate), "How Come and What For," and "In a Manner of Speaking" (concerning English verbs referring to intended acts of communication). Titles of working papers appearing in previous collections are provided. (VM)

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WORKING PAPERS IN LINGUISTICS NO. 8

by

Dale Elliott, Michael Geis,
Alexander Grosu, Barry Nobel,
Ann Zwicky and Arnold Zwicky

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Computer and Information Science Research Center
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Columbus, Ohio 43210
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Foreword

The Computer and Information Science Research Center of The Ohio State University is an inter-disciplinary research organization which consists of the staff, graduate students, and faculty of many University departments and laboratories. This report presents research accomplished in cooperation with the Department of Linguistics.

The work of the Center is largely supported by government contracts and grants. The preparation of four of the papers contained in this report was partly supported by the Office of Science Information Service, National Science Foundation under Grant No. GN-534.1.

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"The Accessibility of Deep (Semantic) Structures", D. Terence Langendoen, pp. 118-127. (To appear in Studies in English Transformational Grammar, R. Jacobs and P. Rosenbaum, eds., Ginn-Blaisdell.)
"Review of Haim Gaifman, 'Dependency Systems and Phrase-Structure Systems', Information and Control 8 (1965), pp. 304-337", pp. 128-136.
"Diphthongs Versus Vowel Sequences in Estonian", Ilse Lehiste, pp. 138-148. (Also in Proceedings of the VI International Congress of Phonetic Sciences, Prague (1967), Academia: Prague, 1970, pp. 539-544.)

No. 2 (November, 1968) (OSU-CISRC-TR-68-3)

"Lexical Entries for Verbs", Charles J. Fillmore, pp. 1-29. (Also in Foundations of Language 4 (1968), pp. 373-393.)
"Review of Componential Analysis of General Vocabulary: The Semantic Structure of a Set of Verbs in English, Hindi, and Japanese, Part II, by Edward Herman Bendix. I.J.A.L. Vol. 32, No. 2, Publication 41, 1966." Charles J. Fillmore, pp. 30-64. (Also in General Linguistics 9 (1969), pp. 41-65.)
"Types of Lexical Information", Charles J. Fillmore, pp. 65-103. (Also in Studies in Syntax and Semantics, F. Kiefer. Ed., D. Reidel: Dordrecht-Holland (1970), pp. 109-137; and Semantics: An Interdisciplinary Reader in Philosophy, Linguistics, Anthropology, and Psychology, Jacobovits and Steinberg, eds., Cambridge University Press (to appear).)
"'Being' and 'Having' in Estonian", Ilse Lehiste, pp. 104-128. (Also in Foundations of Language 5 (1969), pp. 324-341.)

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"More on Nez-Perce: On Alternative Analyses", Arnold M. Zwicky, pp. 115-126. (To appear in IJAL.)
"Greek Variables and the Sanskrit ruki Class", Arnold M. Zwicky, pp. 127-136. (Also in Linguistic Inquiry 1.4 (1970), pp. 549-555.)
"Review of W. F. Mulder, Sets and Relations in Phonology: An Axiomatic Approach to the Description of Speech", Arnold M. Zwicky, pp. 137-141. (To appear in Foundations of Language.)
"A Double Regularity in the Acquisition of English Verb Morphology", Arnold M. Zwicky, pp. 142-148. (To appear in Papers in Linguistics.)
"An Annotated Bibliography on the Acquisition of English Verbal Morphology", Mary Louise Edwards, pp. 149-164.

No. 5 (June, 1969)

Twana Phonology, Gaberell Drachman, pp. i-286, Ph. D. dissertation, University of Chicago, 1969. [Limited printing; not sent out to everyone on the mailing list.]

No. 6 (September, 1970) (OSU-CISRC-TR-70-12)

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"Relative Clause Structures and Constraints on Types of Complex Sentences", Sandra Annear Thompson, pp. 20-40.
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"On Coreferentiality Constraints and Equi-NP-Deletion in English", Alexander Grosu, pp. G-1--G111.
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Introduction

The paper in this issue of Working Papers in Linguistics concern syntax and semantics--theoretically and with special reference to English. The contribution by Dale Elliott (also submitted as a Ph.D. dissertation, June 1971) and three of the contributions by Arnold Zwicky were supported in part by the National Science Foundation under Grant No. GN-534. Some of the papers were also supported by a separate NSF grant to the Mathematical Social Sciences Board. The remaining papers are indirect outgrowths of GN-534; the publication of the papers has been made possible by support from the Graduate School of The Ohio State University. Appropriate acknowledgment is given with each paper.

The Grammar of Emotive and Exclamatory Sentences in English*

Dale Eugene Elliott

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INTRODUCTION

This is a study in the syntax and semantics of some classes of English sentences which express "emotive" or "exclamatory" predications. In Chapters I and II, I examine a group of nouns, verbs and adjectives which I call the "exclamatory" predicates. The predicates in this class, which include amaze, awful, fascinate, etc., are of interest because they govern the occurrence of a complement type which I call embedded exclamations and the application of a syntactic rule which I call noun-phrase extraposition. I provide evidence that embedded exclamations are syntactically distinct from embedded questions, a complement type with which they have sometimes been confused, and show that exclamatory predicates are a distinct subclass of the larger class of "emotive" predicates described by Kiparsky and Kiparsky (1968). In my discussion of the rule of noun-phrase extraposition, I show that this rule must be distinguished from the syntactic rule of "dislocation," which in some cases derives superficially similar sentences. In addition, I discuss some interesting constraints on the noun-phrase extraposition rule. Sentences (1) and (2) below contain embedded exclamations, and sentence (3) is derived by the application of the noun-phrase extraposition rule.

(1) It's amazing how extremely intelligent he is.

(2) It's fantastic what an expensive car she drives.

(3) It's awful the things they said to me.

In Chapter III, I survey recent syntactic research as it pertains to the so-called "flip" rule, which is governed by verbs such as annoy, amuse, frighten, etc. This rule relates sentences like (4) and (5).

(4) Bill amuses me.

(5) I am amused at Bill.

In this chapter, I present a number of facts which cast doubt on some important aspects of previous accounts of the nature of this rule and present an alternative, but still tentative, analysis.

In Chapter IV, I treat the syntax and semantics of "concessive" constructions. Sentences (6) and (7) contain instances of these constructions as, respectively, subject and object complements.

(6) Whoever has the lucky number will win a prize.

(7) I will buy whatever you have to sell.

Although earlier grammarians such as Jespersen have made extensive comments on these constructions, they have never, so far as I know, been treated within the framework of transformational syntax. I therefore provide a general analysis of the characteristics of concessive constructions, followed by a discussion of their emotive aspects, based largely on their paraphrase relationships with sentences containing predicates like irrelevant and unimportant.

The major claim of this thesis is that sentences in English containing emotive or exclamatory predicates exhibit some unique syntactic properties. Thus, besides the intrinsic interest of an analysis of these sentences, a study such as this has a wider theoretical interest because it has something to say about a particular aspect of

the relationship between syntax and semantics. Some recent papers, such as Kiparsky and Kiparsky (1968) and Zwicky (forthcoming), have demonstrated that some semantic classes of words govern the occurrence of particular syntactic constructions, and thus that, at least in the particular cases considered by these authors, syntactic classes can in fact be specified semantically. It is, I think, quite likely that future syntactic research will uncover many more such cases. This particular research strategy thus joins several other recent lines of inquiry which point to the conclusion that no sharp distinction between syntax and semantics can be made.

The relationship between syntax and semantics has been a point of controversy among transformational linguists since the publication of Chomsky's Syntactic Structures in 1957. In this work, Chomsky proposed a syntactic theory which was "completely formal and non-semantic." (p. 93). To support his contention that such a theory is the only possible basis for constructing a grammar, Chomsky listed and rejected six "common assertions put forth as supporting the dependence of grammar on meaning" (p. 94). The last three were these:

> [T]he grammatical relation subject-verb (i.e., NP-VP as an analysis of Sentence) corresponds to the general "structural meaning" actor-action;
>
> [T]he grammatical relation verb-object (i.e., Verb-NP as an analysis of VP) corresponds to the structural meaning action-goal or action-object of action;
>
> [A]n active sentence and the corresponding passive are synonymous.

As things have turned out, the realization that the first two points are untrue is essentially the insight that underlies the theory of case grammar as proposed by Fillmore (1968), a theory which is by no means "formal and non-semantic." To demonstrate the falsity of the last point, Chomsky gave the following examples (pp. 100-101):

(8) Everyone in the room knows at least two languages.

(9) At least two languages are known by everyone in the room.

He claims that these two sentences are not in fact synonymous, even though actives and passives in general are. Again, the syntax of "quantificational" sentences such as these has been the focal point of much later discussion, especially since many native speakers disagree with Chomsky's claim that (8) and (9) are not synonymous. The essential point, however, is that at the stage in the development of his theory represented by Syntactic Structures, Chomsky was unable to find any substance in the proposal that appeals to meaning aid in the construction of a grammar. Therefore, at this point, a clean break was envisioned between the syntactic and semantic descriptions of a language.

Katz and Fodor (1964) made the first effort within the theory of transformational grammar to bring what is now called a "semantic component" into a total linguistic description. This component was to contain lexical entries breaking individual words down into more primitive semantic elements relevant to systematic semantic relationships within a language. In addition, there were to be "projection rules" which would, by taking account of these relationships within and between sentences, provide semantic interpretations of sentences

and appropriately characterize some sentences as ambiguous, anomalous, or synonymous with other sentences. These rules operated on complete structural descriptions of sentences, including their transformational history, and were tentatively to be of two types: those operating on "kernel" sentences, derived by obligatory transformations, which never change meaning, and another type operating on sentences derived by one or more optional transformations, which sometimes change meaning.

However, Katz and Fodor pointed out that "it would be theoretically most satisfying if we could take the position that transformations never change meaning" (p. 515). The difficulty with this was just those cases where transformations as they were formulated at the time, such as the question, negative and imperative rules, did change meaning. But, Katz and Fodor continued, "such troublesome cases might be troublesome only because of an inadequacy in the way we are now formulating these transformations" (p.515).

Katz and Postal (1964) later maintained that this was indeed true and that all transformations could be formulated as obligatory (except for late stylistic rules) and therefore non-meaning-changing.[1]

---

[1]See Partee (1971) for a challenge to the proposal that no transformations change meaning.

As later developed by Chomsky (1965), this led to the view that "all information relevant to a single interpretation of a particular sentence" (p. 16) is contained in the base phrase-marker or "deep structure" of that sentence, and that semantic projection rules operate only upon deep structures. Thus by this point, semantics had been brought into the total linguistic description. But the semantic

component simply provided semantic interpretations for the deep structures generated by the syntactic base component. Thus it would be merely an accident if certain syntactic configurations defined by the base component always contained one of a semantically specifiable set of words. Nowhere would the theory predict the occurrence of such a situation.

Around 1965, there began to appear a large number of syntactic studies in which deep structures were proposed which were increasingly more "abstract" than any which had been proposed up to that time. That is, deep structures came to be more and more unlike the actual surface form of the sentences which they were supposed to underlie. Very soon, a number of people, particularly Lakoff and Ross (1968), Bach (1968), and McCawley (1967, 1968a, 1968b) noticed that such structures were beginning to look very much like full semantic representations, i.e., there were reasons for putting into the syntactic structures of sentences information that might previously have been assumed to be the work of the semantic component.

It was an easy step from this to proposing that such a trend might continue all the way, and that there should in fact be no difference between syntactic and semantic representations, that they are simply the same thing.

Of course, this view is not universally accepted. Chomsky (forthcoming) and some of his students (e.g., Jackendoff (1969a), (1969b)) have focused their attention on many cases where, they claim, surface structure appears to be relevant to semantic interpretation. Thompson (1969) maintains that there is no motivated way of representing in deep structures information about presupposition and definiteness

versus indefiniteness, and that such information must remain outside what she calls the "base elemental structure" of a sentence.

The present study is relevant primarily to one particular aspect of the relationship between syntax and semantics, namely, the fact that some semantic classes of words have, so to speak, their own syntax. That is, there are various constructions and transformational rules which can be shown to correlate with semantic classes.

Zwicky (1968) has explicitly proposed that the investigation of such cases be made a goal of linguistic theorizing. He points out that there is an obvious parallel between the notion of semantic classes which govern particular transformational rules, and the notion of natural classes in phonology. A phonological theory must make it easier to refer to a class of sounds, e.g., voiced stops, that undergo particular phonological rules, e.g., final devoicing, than to arbitrary groups of sounds that never function as a class in any rules. However, as Zwicky says, although the idea of naturalness has a long history in phonology, it is very rarely made explicit in studies of syntax.

Nevertheless, Zwicky continues, "virtually every word class that has received attention in the literature on transformational grammar is characterized by a high degree of semantic coherence" (p. 97). He mentions particularly the class of factive verbs, that is, verbs taking that-complements whose truth is presupposed by the speaker. These verbs are analyzed in detail in Kiparsky and Kiparsky (1968), a paper to be referred to again later, since the notion of factivity plays an important role in the discussion of some of the constructions considered here.

This thesis attempts to demonstrate that there are several widely scattered areas of English syntax where appeal must be made to the notion of "emotive" or "exclamatory" predications in order to account for a wide array of syntactic and semantic facts. Zwicky (1968, p. 101) suggests two ways in which considerations of naturalness might be made a part of syntactic theory. The first of these appears to be an adequate way to characterize the general type of situation described in the present study. He says that "it may be possible to press the correlation of semantic and syntactic classes to the conclusion that a syntactic class is no more than a semantic class minus or plus a small list of exceptions. In other words, some natural syntactic classes might be referable to semantic classes in the same way that some phonological classes might be referable to phonetic classes."

It seems to me that this approach to syntactic analysis may turn out to be one of the most fruitful of those currently available. However, its advantages and limitations are by no means entirely clear. This thesis is intended as a contribution towards determining the viability of such an approach to the study of grammar.

CHAPTER ONE

THE GRAMMAR OF EXCLAMATIONS

Many grammarians have attempted to provide systems for the classification of sentence types in a language. Jespersen (1965, p. 301) notes that Brugmann, in his Verschiedenheiten der Satzgestaltung, proposed eight separate types, with each type having up to eleven subclasses. Jespersen finds it "difficult to see the rationale" of such an elaborate classification, and suggests that the "older classification", including only statements, questions, desires and exclamations, is "much clearer" (p. 301). But even here, he suggests that the boundaries between the different types are not entirely distinct. Such attempts at classification have as yet received little attention from transformational linguists, and to my knowledge, exclamatory sentences have never been studied at all by grammarians working within the generative framework.

My purpose here is to provide evidence that an adequate grammar of English must recognize exclamations as a separate sentence type. I will discuss independent or "absolute" exclamations, but will concentrate on embedded exclamations.

As Jespersen says, it is possible to classify sentences in two ways: notionally and syntactically. However, the two types of classification "should be kept strictly apart" (1965, p. 302).

The sentence "There is a snake in the icebox" may, with normal intonation, be a simple declarative statement of fact. But in the proper circumstances, and with a different intonation, it might qualify notionally as an exclamation.[1] Jespersen remarks (1965, p. 302) that

---

[1]It is possible, of course, that intonation is as important a marker of sentence type as any of the syntactic criteria I use here. This, however, is an area which I have not as yet investigated.

---

some "statements" and "questions" such as "I want a cigar" or "Will you give me a light, please?" can be classed notionally as imperatives. This point has been taken up by Sadock (1970), who shows that some yes-no questions in fact behave syntactically like imperatives, and thus must be analyzed as, in their underlying structure, conjunctions of questions and imperatives.

Furthermore, there are various types of expressions which may be said to have an exclamatory force, but for which I am not yet able to propose any motivated analysis as such. Sentence (1) is an example.

(1) The things I have to put up with!

(1) may well be related to sentences such as (2)

(2) It's { fantastic / awful / incredible } the things I have to put up with!

The latter type of sentence is discussed in detail in Chapter II. It is mentioned there that sentences like (2) do not allow head nouns with indefinite articles. The same is true of (1).

(3) It's awful the things she said to me.

(4) The things she said to me!

(5) *It's awful a thing she said to me.

(6) *A thing she said to me!

It will be easy to see, therefore, that this chapter and the following one do not constitute an exhaustive study of exclamations in English. They do provide clear indication that the particular properties of these sentences must be taken account of in the grammar of English.

A. ABSOLUTE EXCLAMATIONS

The paradigm examples of absolute exclamations are sentences like the following:

(7) What an attractive woman she is!

(8) What a good boy I am!

(9) How attractive she is!

(10) How beautiful this mountain is!

(7)-(10) have paraphrases with so or such.

(11) She is such an attractive woman!

(12) I am such a good boy!

(13) She is so attractive!

(14) This mountain is so beautiful!

(7)-(10) show the WH-forms what and how, and sentences with these forms are consistently judged grammatical by speakers of English. However, the grammatical status of absolute exclamations with other WH- words is not so clear.

(15) ?*Which countries he chose to go to!

(16) ?*Why he bought that coat!

(17) ?*Who you meet on the street!

(18) ?*Where our campus is located!

(19) ?*When they chose to get married!

Many native speakers, including the writer, have difficulty arriving at clear judgments about the grammaticality of such sentences. (20)-(24) would probably be acceptable to most speakers.

(20) He chose to go to such countries!

(21) He bought that coat for such a reason!

(22) You meet such people on the street!

(23) Our campus is located in such a place!

(24) They chose to get married at such a time!

And (25)-(29) may be related to (20)-(24) as (7)-(10) are related to (11)-(14).

(25) What countries he chose to go to!

(26) What a reason he bought that coat for!

(27) What people you meet on the street!

(28) What a place our campus is located in!

(29) What a time they chose to get married at!

Presumably (30) is to be derived from something roughly like (31) and (32) from something like (33).

(30) Why did you go?

(31) You went for WH-some reason.

(32) Where does John live?

(33) John lives in WH-some place.

Synonymous with (30) and (32) respectively, we have (34) and (35).

(34) What reason did you go for?

(35) What place does John live in?

Thus, if we reject (15)-(19), as I think we would probably want to do, then we are left to conclude that the ungrammaticality of these sentences is idiosyncratic.[2] This impression is reinforced when we observe (see Part B below) that (15)-(19) are all perfectly acceptable when embedded.[3] So we can propose that absolute exclamations with what and how are derived from the corresponding forms with such and so, with absolute exclamations limited to these two WH-forms, at least in standard dialects.

[2]As this was being written, J. R. Ross, in a lecture at U.C.L.A., used as examples sentences very similar to (15)-(19), but intended them to be taken as instances of Yiddish-influenced English.

[3]The same sort of situation is found with whether clauses, which also are grammatical only when embedded.

(i) I don't know when he is going.
(ii) I don't know whether he is going.
(iii) When is he going?
(iv) *Whether is he going?

Although these exclamatory sentences show some morphological similarities to questions, it should be obvious that they are not questions. Semantically, of course, there is no relationship. In fact, as will be seen below, exclamatory complements are always interpreted as factives. Syntactically, there are several differences.

1. Independent questions require subject-verb inversion.

(36) How attractive is his wife?

(37) *How attractive his wife is?

Exclamations typically do not show inversion, but with it are grammatical, if somewhat archaic.

(38) How attractive his wife is!

(39) How lovely is Thy dwelling place, O Lord of Hosts!

2. Exclamations do not allow else.

(40) What else did Marvin do?

(41) *What else Marvin did!

3. Exclamations do not allow ever.

((43) What did you ever do for me?

(44) *What you ever did for me!

4. Exclamations do not allow any.

(45) How does John make any money?

(46) *How John makes any money!

On the other hand, there are some interesting similarities between questions and exclamations, which will be discussed below.

B. EMBEDDED EXCLAMATIONS

There are two basic processes by which complex sentences are constructed out of simple ones: conjoining and embedding. An enormous amount of research has been done on the properties of these two fundamental syntactic processes. Various types of embedded sentences have been recognized, including subject and object complements, embedded questions, relative clauses, etc. I wish to show here that an additional type must be recognized: embedded exclamations.

Some traditional grammarians have recognized the existence of such constructions in their treatments of English syntax. Onions (1969, p. 70) posits two types of noun clauses, those introduced by that, and "those which are introduced by an interrogative or exclamatory word." As an example of a clause introduced by an exclamatory

word, he gives the following sentence:

(46) It is strange how unjust you are.

According to Onions, "Here the Subordinate Clause is exclamatory and is called a Dependent Exclamation, the sentence as a whole being a statement."[4]

---

[4]Onions (1969, p. 3) recognizes four sentence types: statements, commands or expressions of wish, questions and exclamations.

Kruisinga (1932, Part II.2, p. 182) remarks on the use of what in "dependent exclamations." This use of what "...is formally distinguished from the interrogative function of what by the article before singular class nouns." He offers the following example:

(47) Mr. and Mrs. Ambrose were far from guessing what an intimacy had sprung up between the two.

It will be demonstrated in this chapter that embedded exclamations must be clearly distinguished from embedded questions. Poutsma (1929, Part I, 2nd half, p. 630) does not observe this distinction, but comments that "subordinate questions introduced by what or by how often correspond to exclamatory sentences." He gives (48) and (49) as examples.

(48) They began to talk of what a dreadful storm it had been the night before.

(49) It was curious how emotion seemed to olden him.

Exclamations can be embedded as objects on certain factive verbs:

(50) I know what an attractive woman she is.

(51) I know she is such an attractive woman.

(52) John realizes what a good boy I am.

(53) John realizes I am such a good boy.

Some speakers accept sentences with exclamations embedded as non-extraposed subject complements onto factive predicates.

(54) ?What an attractive woman she is amazes me.

(55) ?How beautiful this mountain looks is fantastic.[5]

---

[5]Notice that questions embedded as subject clauses without extraposition are unquestionably grammatical.

(i) How intelligent he is is a mystery.

But (ii) is marginal in my dialect.

(ii) ?*How intelligent he is is fantastic.

---

(15)-(19), as I said above, are grammatical when embedded.

(56) It's terrible which countries he chose to go to.

(57) It's unbelievable why he bought that coat.

(58) It's awful who you meet on the street.

(59) It's a crime where our campus is located.

(60) It's amazing when they chose to get married.

It is immediately obvious that some of these embedded exclamations are on the surface identical with embedded questions. But again there are several reasons why the two constructions cannot be identified syntactically, and therefore why embedded exclamations must be recognized as a separate type.

1. The "what a..." construction is not even superficially identical to any embedded question type.

(61) It's fantastic what a nice house he has.

(62) *I wonder what a nice house he has.

2. Exclamations allow modification by very and other adverbs such as really, extremely, unbelievably, unusually, etc., which questions do not allow.

(63) It amazes me how very long he can stay under water.

(64) I asked how very long he can stay under water.

(65) *It infuriates me how extremely rude he is.

(66) *I wonder how extremely rude he is.[6]

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[6]But exclamations do disallow adverbs like slightly, somewhat, reasonably, etc.

(i) *It infuriates me how slightly rude he is.

---

3. Exclamations allow appositive constructions; questions do not.

(67) It's incredible what sort of house he lives in, a two-room shack.

(68) *It's unknown what sort of house he lives in, a two-room shack.

4. Exclamations allow namely; questions do not.

(69) It's unbelievable who I met on the street, namely Mary Queen of Scots and Attila the Hun.

(70) *Can you guess who I met on the street, namely Mary Queen of Scots and Attila the Hun?[7]

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[7]Points 3 and 4 are true only of those embedded questions which can be thought of as actually "posing a question." Thus, (i) and (ii) are grammatical.

(i) It's known what sort of house he lives in, a two-room shack.

(ii) She guessed who I met on the street, namely Mary Queen of Scots and Attila the Hun.

Ross, in his U.C.L.A. lecture referred to above, talked about what he called "conjunctive questions," which should apparently be identified with my "embedded exclamations." Ross gave no evidence why these constructions should be considered a type of question. He provided, as evidence for distinguishing "conjunctive" from true embedded (or "disjunctive") questions points very similar to my 3 and 4 above. In addition, he noted that "disjunctive questions" allow whether and expressions like the hell, whereas "conjunctive questions" exclude both. The following examples illustrate these facts.

(71) I wonder whether he's coming or not.

(72) *It's fantastic whether he's coming or not.

(73) Do you know what the hell he's doing?

(74) *It's awful what the hell he's doing?

Finally, we may note that at least two of the points given in section A above to distinguish independent exclamations from independent questions can also be used to distinguish embedded exclamations from embedded questions. I pointed out that questions allow ever and any, but exclamations do not.

(75) Can you tell me what you ever did for me?

(76) *It's incredible what you ever did for me.

(77) I wonder how John makes any money.

(78) *It's fantastic how John makes any money.

These facts suffice to show that embedded exclamations are a separate syntactic type. There are cases, such as (79), where an

embedded complement is ambiguous as between a question and an exclamation.

(79) John knows what lies Charles tells.

This ambiguity will be discussed later in this chapter.

One piece of recent syntactic research which is relevant to the problems considered here is Kiparsky and Kiparsky's "Fact" (1968). The authors posit a class of predicates distinguished by the feature "emotive," which they write [EMOT]. This feature is relevant to "all predicates which express the subjective value of a proposition rather than knowledge about it or its truth value" (p. 27).

The Kiparskys wish to claim syntactic consequences for this feature, arguing that complementation with FOR-TO depends on the presence of head items with this feature. They reject the analysis of FOR-TO complementation given by Rosenbaum (1967), and propose instead that this type of complementation is dependent on the "semantically natural" class of emotive predicates, since "it is this class of predicates to which FOR-TO complements are limited."

This feature intersects with the feature [±FACT] proposed in the same paper. That is, the class of [+EMOT] predicates includes both factives and non-factives. Kiparsky and Kiparsky provide the following lists:

[+EMOT, +FACT]	
important	alarm
relevant	exhilarate
crazy	fascinate
odd	nauseate
instructive	defy comment
sad	surpass belief
suffice	a tragedy
bother	no laughing matter

[+EMOT, -FACT]

improbable	urgent
unlikely	vital
nonsense	intend
a pipedream	prefer
reluctant	willing
anxious	eager

More recent research has provided evidence that the Kiparsky' claim about FOR-TO complementation cannot be maintained. Stockwell (1970) has attempted to show that this type of complementation cannot in fact be tied to emotive predicates. It was early noted by several people that, although the Kiparskys' listed regret, resent and deplore as factive emotives, very few native speakers accept FOR-TO complements with these verbs.

(80) *I regret for Howard to be sick.

(81) *I resent for him to make more money than me.

(82) *I deplore for Latin to have been replaced by English.

Furthermore, as Stockwell points out, there are a number of other predicates that are semantically emotive, but do not allow FOR-TO.

(83) *I desire for that to happen.

(84) *Michael hopes for the stock market to crash.

(85) *Nelson anticipates for his wife to divorce him.

He also notes that several predicates which cannot reasonably be considered to be emotives do allow FOR-TO.

(86) It is usual for Scotch to be drunk straight.

(87) It is customary for enlisted men to salute officers.

(88) It is legal for men to have six wives in some countries.[8]

[8]As Arnold Zwicky has pointed out to me, there seem to be two classes of non-emotive predicates which allow FOR-TO. One includes predicates such as those in (86) and (87) and semantically similar ones such as typical, general and normal. The other includes predicates such as legal, permissible, allowable, possible, O.K., etc. However, Gaberell Drachman has noticed that circular also allows FOR-TO, as in (i).

(i) It is circular for you to argue in that way.

Circular, as Drachman observes, does not seem to fit readily into either class.

Criminal allows FOR-TO in both the literal sense of "illegal" and the emotive sense.

(89) It is criminal for groups of companies to fix prices.

(90) It is criminal for him to be so rude to his elders.

Stockwell proposes a more inclusive analysis of FOR-TO complementation, involving a rule of "FOR-insertion" governed by a class of nouns, verbs and adjectives specified by the strict subcategorial feature [+___(DAT) S], since the semantic feature [EMOTIVE] cannot reasonably be expanded to cover all the eligible predicates. Thus in this treatment the relevant semantic notion is Dative, not Emotive. However, Dative must be made an optional element in the case frame above, because of sentences like the following:

(91) It is impossible for such a catastrophe to overtake us.

(92) It is illegal for the streets to be so dirty.[9]

[9]Laurence Horn has proposed, at a U.C.L.A. Linguistics Department Colloquium, that the presence or absence of a Dative in these sentences is reflected syntactically. In his dialect, (i) is grammatical, but not (ii).

(i) It is illegal for men to do that, but not for women.

(ii) It is illegal for the streets to be so dirty, but not for the sidewalks.

I would admit both of these indifferently, however.

It seems, then, that the flat statement that FOR-TO complements are limited to the class of emotive predicates, although supported by much evidence, cannot be maintained in either direction, since there are emotive predicates which do not allow FOR-TO, and non-emotive predicates which do.[10]

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[10]This summary of Stockwell's remarks is based on an informal presentation at U.C.L.A. in July 1970.

The Kiparskys present a few brief remarks about other syntactic properties of emotive predicates. The purpose of this chapter is to show that there is a large subclass of emotives which must be separated out as the "exclamatory" predicates.

In the example sentences so far, I have used a number of factive predicates other than those given by Kiparsky and Kiparsky (1968). One of the most important claims made by these authors is that there are several syntactic constructions found only in sentences with factive predicates. Thus only such sentences allow the "fact that S" construction and POSS-ING complementation, and whereas some non-factive predicates require extraposition, application of this rule is optional in sentences with factive predicates. Conversely, sentences with factive predicates do <u>not</u> allow subject-raising.

The additional predicates that I have used in my examples fit the semantic definition of factives, in that they presuppose the truth of their complement sentences. For example, (93) presupposes

that John eats tuna fish for breakfast.

(93) It's amazing that John eats tuna fish for breakfast.

The following examples illustrate that exclamatory predicates satisfy the syntactic criteria for factivity.

FACT THAT S

(94) The fact that John eats tuna fish for breakfast is terrible.

(95) *The fact that John eats tuna fish for breakfast is possible.

POSS-ING

(96) John's eating tuna fish for breakfast is unbelievable.

(97) *John's eating tuna fish for breakfast is likely.

SUBJECT RAISING

(98) *John is awful to eat tuna fish for breakfast.

(99) John is certain to eat tuna fish for breakfast.

OPTIONAL EXTRAPOSITION

(100) That John eats tuna fish for breakfast is infuriating.

(101) It's infuriating that John eats tuna fish for breakfast.

(102) *That John eats tuna fish for breakfast seems.

(103) It seems that John eats tuna fish for breakfast.

In the light of this syntactic evidence, and because these predicates obviously fit the semantic definition for emotives, we may establish exclamatory predicates as factives, and as a subclass of emotives.

It is now necessary to show that exclamatory predicates are indeed a subclass of emotives, and are not simply co-extensive with that class.[11] Consider the following sentences with important, given

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[11]It is likely that these two classes can be arrayed along a scale with exclamatory predicates farther toward the "top" than

emotives. Some remarks suggestive of such an interpretation have been made recently by Lakoff (1970b). He observes that semantically similar predicates can be arranged from strongly positive to strongly negative, and that only predicates at the "ends" of the scale allow, for example, modification by absolutely.

(i) She's absolutely beautiful.
(ii) *She's absolutely attractive.
(iii) She's absolutely repulsive.

---

by Kiparsky and Kiparsky (1968) as a factive emotive.

(104) It's important how attractive she is.

(105) It's important which countries he chose to go to.

(106) It's important why he bought that coat.

These appear to be on the same pattern as sentences like (56)-(60).

But now notice that (107), in many dialects at least, is not grammatical.

(107) *It's important what an attractive woman she is.

We have also, of course, sentences (108)-(110).

(108) It's amazing how attractive she is.

(109) It's amazing which countries he chose to go to.

(110) It's amazing why he bought that coat.

And (111) is grammatical.

(111) It's amazing what an attractive woman she is.

Now although both important and amazing are emotives by the criteria used so far, including the semantic criterion of the speaker's subjective reaction, the semantic force of the complement sentences in (104)-(106) seems to be quite different from that of the complements in (108)-(110).

One illustration of this is the fact that (104)-(106) can be paraphrased by a sentence with a FOR-TO complement with we as

subject. Cf. (112).

(112) It's important for us to know how attractive she is.

But (113) is not at all synonymous with (108).

(113) It's amazing for us to know how attractive she is.

The complement sentences in (104)-(106) are actually embedded questions. The complement sentences in (108)-(110), however, cannot be so interpreted. This is fairly obvious, but there is evidence in addition to that given above. It has been pointed out by Baker (1968) that sentences containing indirect questions can be paraphrased by sentences with "the answer to the question..." or expressions of that sort. For example, (104) is essentially paraphrased by one reading of (114).

(114) The answer to the question "How attractive is she?" is important.

However, there is an important difference between (108) and (115).

(115) The answer to the question "How attractive is she?" is amazing.

(108) presupposes that she is in fact attractive, but "the answer to the question" in (115) could be "She isn't attractive at all." That is to say, in these exclamatory expressions, the opposition between antonym pairs is not neutralized. It has been frequently observed that such neutralization does occur in questions and comparatives. For example, one may ask

(116) How tall is Lew?

or say

(117) Lew is taller than Jerry.

even if one knows that it would be appropriate to say of Lew that

he is short. This neutralization remains in indirect questions.

(118) Can you tell me how tall Lew is?

But (119) is appropriate only if Lew is tall, and not if he is short.

(119) It's amazing how tall Lew is.

Thus we have found evidence that the Kiparskys' class of emotive predicates display syntactic differences among themselves with respect to certain complements they may take.

There are at least two other examples in the above list of factive emotives that seem to act like <u>important</u>, namely <u>relevant</u> and <u>instructive</u>. These two, although they are semantically emotive, do not really convey the exclamatory meaning of <u>amazing</u> or, for that matter, of the other predicates given by the Kiparskys in this particular list of examples. And here again we may note paraphrase pairs like those given above.

(120) It's relevant how many hot dogs he ate.

(121) It's relevant for us to know how many hot dogs he ate.

(122) It's instructive how many hot dogs he ate.

(123) It's instructive for us to know how many hot dogs he ate.

But compare these with (124) and (125).

(124) It's fascinating how many hot dogs he ate.

(125) It's fascinating for us to know how many hot dogs he ate.

In rather impressionistic terms, in (124), it is the <u>number</u> of hot dogs he ate that is fascinating, whereas in (125), it is the knowledge that he ate a certain number of hot dogs that is fascinating, although the number itself may not be fascinating at all. Notice that we may say

(126) It's fascinating merely to know how many hot dogs he ate.

but not

(127) *It's fascinating merely how many hot dogs he ate.

although (128) is grammatical.

(128) It's relevant merely how many hot dogs he ate.[12]

---

[12]Facts like these may be taken as an indication that the verb "to know" is in fact present in the underlying structure of a sentence like (120).

In conjunction with a number of facts pointed out above, it is important to observe another characteristic of the predicates important, relevant and instructive. It seems to me that at least with FOR-TO complements they are not semantically factive.

(129) It's important for Mary to take this medicine.

(130) It's relevant for John to criticize these proposals.

(131) It's instructive for you to do these exercises.

I think it is accurate to say that the truth of the proposition expressed by the complement sentences in (129)-(131) is not presupposed. Compare these with (132)-(134).

(132) It's odd for Mary to take this medicine.

(133) It's alarming for John to criticize these proposals.

(134) It's a tragedy for you to do these exercises.

Here, on the other hand, I would agree with the Kiparskys' judgment that these predicates take factive complements.

The interesting thing to note is that the three predicates in (129)-(131) are exactly those which do not take exclamatory complements.

Also as noted above, those predicates which do permit exclamatory complements preserve factuality in these complements as well, just as they do with FOR-TO and other complement types.

This is one of the most important observations to be made about exclamations, namely, that they are always factive. This shows up in several interesting ways. The examples of exclamatory complements given so far have all been in affirmative sentences. Most speakers find negatives ungrammatical.

(135) *It isn't fascinating how beautiful Jane is.

Correspondingly, (136) and (137) are also ungrammatical.

(136) *What a beauty Jane isn't!

(137) *How beautiful Jane isn't!

The ungrammaticality of all three of these sentences can be explained on the same basis: the exclamatory complement presupposes that Jane is remarkably beautiful, but this is denied by the rest of the sentence.

Negative <u>questions</u> with exclamatory predicates are grammatical, but positive questions are at best marginal.

(138) Isn't it fascinating how beautiful Jane is?

(139) ?*Is it fascinating how beautiful Jane is?

This is easily explainable on the usual account of the particular semantic function of negative questions. Such questions presuppose that the answer will be <u>yes</u>. Therefore a speaker using (138) must assume that Jane is in fact fascinatingly beautiful. Plain yes-no questions, on the other hand, make no assumption either way. Therefore, in (139), the presupposition of the exclamatory complement contradicts the presupposition of the question as a whole.

To be considered in Chapter II is a type of noun-phrase extraposition that is possible only in sentences with exclamatory predicates. Here, negative declaratives and positive questions are clearly excluded.

(140) It's awful the prices you pay for tomatoes.

(141) *It isn't awful the prices you pay for tomatoes.

(142) *Is it awful the prices you pay for tomatoes?

Both (143) and (144) are grammatical.

(143) I think the prices you pay for tomatoes are awful.

(144) He thinks the prices you pay for tomatoes are awful.

But some speakers claim that for them NP extraposition is possible only in (143).

(145) I think it's awful the price you pay for tomatoes.

(146) ?*He thinks it's awful the price you pay for tomatoes.

Ross (1970) and Sadock (1969) have proposed that in the underlying structure of every sentence there is an abstract "performative" verb.[13] Thus it is claimed that (147) is closer to the underlying

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[13]Sadock uses the term "hypersentence." Ross borrowed the term "performative" from the philosopher J. L. Austin.

---

structure of (148) than (148) itself.

(147) I declare to you that your house is on fire .

(148) Your house is on fire.

Ross and Sadock present much persuasive evidence in favor of the performative analysis. Although it will require a considerable amount

of further research to establish the point, the facts outlined in examples (135)-(146) may be taken as evidence that there is an abstract performative "I exclaim that..." in the underlying structure of all exclamations.

We can now return to a problem alluded to earlier. It was noted that in sentences like (149) the complement is ambiguously interpretable as an embedded question or as an exclamation.

(149) Do you know what stories John tells?

The ambiguity remains in declaratives, e.g. (150).

(150) I know what stories John tells.

There are cases, however, where this ambiguity does not appear. One such case is that of an exclamatory complement the surface form of which does not match that of an embedded question, as in (151).

(151) Do you know what a nice person John is?

This raises the general question as to when this ambiguity is and is not possible. The explanation for cases like (151) is obvious. Embedded questions are presumably related to "independent" questions, but there is no independent question corresponding to the complement in (151).

(152) *What a nice person is John?

As noted above, the existence of an exclamatory complement with a unique surface form provides one reason for isolation of the class of exclamatory predicates.

It appears that an account of the possibilities for ambiguity in these constructions must treat exclamatory complements as full sentences, i.e., behaving like THAT- complements. But the exclamatory predicates, whether they occur overtly or are assumed to be present

as abstract performatives, are all factive, and so the truth of the exclamatory complement is always presupposed. THAT- complements, of course, can occur with both factive and non-factive predicates.

(153) I regret that John murdered Hubert. (Factive)

(154) I claim that John murdered Hubert. (Non-factive)

But exclamatory complements can occur only with factive predicates.

(155) I regret how tall she is.

(156) *I suppose how tall she is.

(157) *He maintained what lies Bill told.

There is a group of verbs we may call "knowledge" verbs, such as know, realize, forget, have no idea, remember, etc.[14] These verbs

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[14]This class of verbs has been studied by Baker (1968).

---

exhibit certain restrictions with respect to negation and the use of some tenses, when used with first-person subjects.

(158) I know that John loves Marsha.

(159) *I don't know that John loves Marsha.[15]

---

[15](159) is acceptable in the meaning "I am not certain that John loves Marsha."

---

(160) I realize that John loves Mary.

(161) *I don't realize that John loves Mary.

(162) I forgot that you like milk in your tea.

(163) *I forget that you like milk in your tea.

(164) I had no idea that Bill is a pothead.

(165) *I have no idea that Bill is a pothead.

(166) I remember that Elizabeth I died in 1603.

(167) *I don't remember that Elizabeth I died in 1603.

The starred sentences are starred because they are contradictions. Kiparsky and Kiparsky (1968) provide some discussion of sentences like these. As they put it, "the top sentence denies what the complement presupposes" (p. 9).

Now consider the situation with WH- complements, for example with know.

(168) I know how tall she is.

(169) I don't know how tall she is.

(168) is ambiguous, but (169) is not. The complement in (169) is interpretable only as an embedded question, but the complement in (168) is ambiguously an embedded question or an embedded exclamation. For example, in (168) tall can be modified by very, but not in (169).

(170) I know how tall she is.

(171) *I don't know how very tall she is.

Lakoff (1970a) has offered a test for distinguishing ambiguity from vagueness. He claims that "...identity of underlying and not superficial structure is required for the operation of the rule of VP-deletion" (p. 358). The sentence

(172) Selma likes visiting relatives.

has two meanings:

A. Selma likes to visit relatives.

B. Selma likes relatives who are visiting.

But (173) must be understood either with meaning A for both conjuncts, or with meaning B for both conjuncts.

(173) Selma likes visiting relatives and so does Sam.

It cannot be understood with meaning A for the first conjunct and meaning B for the second, or vice versa.

Lakoff's observation can easily be extended to show the ambiguity of sentences like (168). If a complement is ambiguous as to what type of complement it is, specifically in this case as between a question and an exclamation, then if we conjoin to it another complement which is unambigucus on the surface, the ambiguity is removed.

(174) I know how tall she is and <u>whether she is overweight</u>.

(175) I know how tall she is and <u>what a fantastic shoe size she takes</u>.

In (174), the underlined complement can only be an embedded question; in (175), only an embedded exclamation. It is clear that in (174), the first conjunct is interpretable only as "I know her height," and that in (175) the first conjunct is interpretable only as "I know how very tall she is," i.e., as an exclamaton.

The same ambiguity that is found in (168) is found in (176), and, like (169), (177) is unambiguous.

(176) I had no idea how tall she is.

(177) I have no idea how tall she is.

Furthermore, sentences like (178) are ungrammatical.

(178) *I have forgotten what a genius he is.[16]

---

[16] I am perhaps on somewhat shaky ground in starring (178). This sentence can be used as a sort of self-accusation, meaning approximately, "My actions hitherto have indicated that I have forgotten, but now I will act properly." How or whether a fact like this is to be represented systematically is not clear.

The semantic functions of tense and negation and their interactions with factivity must be investigated in order to account for sentences like (160)-(167). But, in the more limited context of this discussion, we can say that the lack of ambiguity in WH- complements as between embedded questions and embedded exclamations matches exactly the instances of ungrammaticality in THAT- complements.

It was pointed out above that absolute exclamations have paraphrases with so and such. So and such appear to be in a general suppletive relationship in exclamations, since the same paraphrase possibilities exist in embedded exclamations.

(179) It's unbelievable how intelligent he is.

(180) It's unbelievable that he's so intelligent.

(181) It's unbelievable what an intelligent person he is.

(182) It's unbelievable that he's so intelligent a person.

(183) It's unbelievable that he's such an intelligent person.

All of these are semantically equivalent, and it is reasonable to suppose that there is a syntactic relationship holding at least between (178) and (180) on the one hand, and (181)-(183) on the other. But this relationship does not hold with interesting, instructive or relevant, none of which, I have claimed, take exclamatory complements. Consider the following examples.

(184) It's important how tall he is.

(185) It's important that he's so tall.

(186) It's relevant how tall he is.

(187) It's relevant that he's so tall.

(184) and (185) are not paraphrases, nor are (186) and (187). This is

of course due to the fact that how in (184) and (185) introduces an embedded question, but does not in (179), for example. These observations provide further support for the analysis given here.

In this chapter, I have demonstrated that exclamations are a syntactically isolable complement type in English. I showed that although the predicates which take embedded exclamations belong to the class of factive predicates, they must in fact be considered as a subclass of factives, since their syntactic behavior is different from non-exclamatory members of the general class. I showed also that, although embedded exclamations are in many (but not all) cases identical on the surface with embedded questions, there are several points of difference between the syntactic behavior of the two constructions.

It is obvious that there are numerous other constructions in English which are at least notionally exclamatory, but which have not been considered here. The treatment of the particular construction types considered here will, I hope, provide a framework and a point of departure for any future work on exclamations.

CHAPTER TWO

NOUN PHRASE EXTRAPOSITION IN SENTENCES WITH EXCLAMATORY PREDICATES

It was demonstrated in the preceding chapter that sentences with "exclamatory" predicates show particular syntactic and semantic properties, and thus that these predicates must be specifically recognized in a grammar of English. The present chapter, which investigates the properties of a syntactic rule in English which is governed by this class of predicates, provides further evidence for the basic claims of Chapter I.

A. THE MECHANISM OF EXTRAPOSITION

The term "extraposition" is generally attributed to the Danish grammarian Otto Jespersen. In his Essentials of English Grammar (1964), he discusses what he calls "preparatory it," which is used

> to represent a whole group of words which it would not be convenient to put in the place required by the normal rules of word-order without causing ambiguity or obscurity. The group itself (an infinitive with its complements, a clause, etc.) then comes afterwards in "extraposition."
>
> This it may be the subject.
> It is wrong to lie
> It rests with you to decide.
> It was splendid that you could come today. (p. 154)

Jespersen included a wide variety of grammatical processes under this

heading. Generative grammarians have taken over Jespersen's term to refer primarily to sentences like those just quoted, and to similar sentences such as the following:

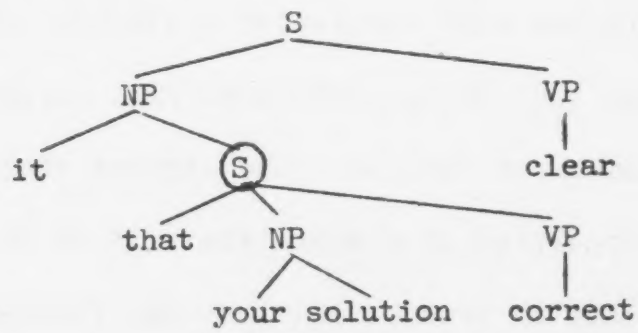
(1) It is clear that your solution is correct.

(2) It seems that the rain has stopped.

(3) A man came yesterday who was selling encyclopaedias.

Deep structures like the following have been proposed for sentences such as (1).

(1a)

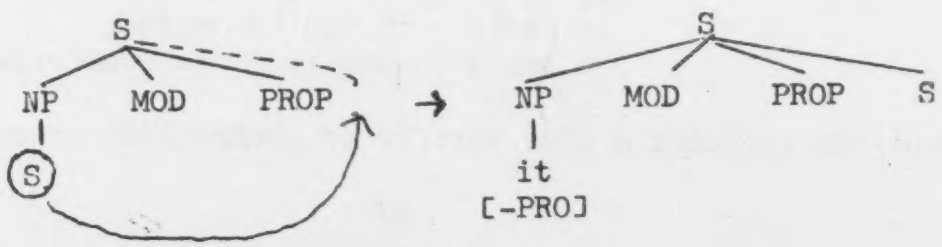


Sentence (1) is derived from the deep structure (1a) by moving the circled S node around the predicate of the top S. The rule is stated as follows (some details omitted) by Rosenbaum (1967, p. 6).

X	N [+PRO]	S	Y	
1	2	3	4	→

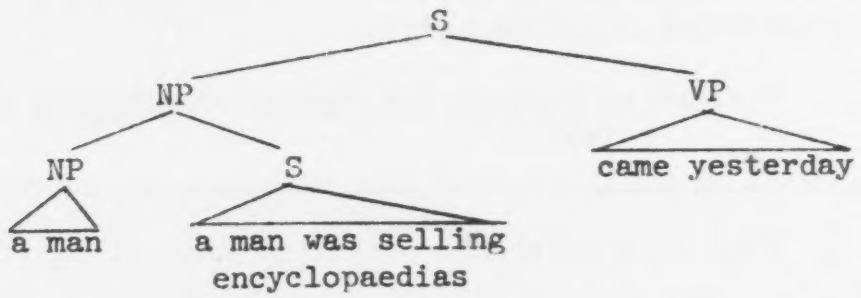
1, 2, Ø, 4, 3

Stockwell, Schachter and Partee (1968), for several reasons, reject the "IT-S" analysis illustrated in (1a), but give a rule having otherwise the same effect as the one above. It is given in "schematic" form as follows: (p. 621)



Extraposition of relative clauses is also possible, as sentence (3) illustrates. Given a deep structure like (3a), it can be seen that (3) also is derived by moving a sentence, after relativization in this case, around a higher predicate.

(3a)



However, Stockwell et al. (1968) do not provide for this type of extraposition, since the "conditions under which extraposition is permitted for relative clauses are more restricted than those for nominalizations, and not as well understood.""

Extraposition from object position is shown in (4).

(4) I regret it that Lucy broke her arm.

This is called by Rosenbaum "vacuous extraposition from object" because the sentence does not in fact "move around" anything. The extraposition transformation has the effect here of simply raising the embedded sentence and attaching it to the top S.

The foregoing is meant as a brief illustration of the mechanism of extraposition transformations. Typically, it is a sentence that is extraposed, although this notion has occasionally been applied to other constituents than S, as in Langendoen (1966).

B. THE RULE OF NOUN PHRASE EXTRAPOSITION

This chapter treats the syntax and semantics of sentences derived by a particular type of noun phrase extraposition. The following are

examples of such sentences.[1]

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[1]The only recent reference that I have seen to the existence of these sentences is in Langendoen's syntax textbook (1969), where they are given in a problem. Accordingly, I have used his examples in (5)-(8). Jespersen gives the following sentence as an example in his discussion of extraposition:

(i) It is strange the number of mistakes he always makes.

---

(5) It's awful the price you have to pay for tomatoes in the winter.

(6) It's a disgrace the way he behaves when he's drunk.

(7) It's marvelous the amount of weight I've lost since I started on the diet.

(8) It never ceases to amaze me the size dress my neighbor wears.

The first point to be made is obviously that (5)-(8) are paraphrased by (9)-(12).

(9) The price you have to pay for tomatoes in the winter is awful.

(10) The way he behaves when he's drunk is a disgrace.

(11) The amount of weight I've lost since I started on that diet is marvelous.

(12) The size dress my neighbor wears never ceases to amaze me.

It might be maintained that (5)-(8) are related to (9)-(12) by a process not of extraposition, but of "dislocation."[2] However, there

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[2]This term is due to Ross (1967).

---

are several arguments that can be presented against this interpretation.

First, sentences (5)-(8) are perfectly grammatical in my dialect, but (13), derived by dislocation from (14), is not.

(13) *It's awful the price.

(14) The price is awful.

(13) is grammatical in some dialects of American English. If (5) is derived from (9) by the same rule that derives (13) from (14) in the dialects of those who accept (13), then (5) should be unacceptable for me, or, conversely, (13) should be acceptable, but this is not the case. One might argue that appropriate restrictions on the dislocation rule would allow (5) and prevent (13), but the points below provide further evidence against this solution.

Second, I suspect that in the dialects of those who accept (13), (5) and (13) have noticeably different intonation patterns, suggesting that even in these dialects, two different rules are involved. In fact, as the arguments below indicate, this is almost certainly the case.

Third, (15), starred because it is ungrammatical for me, is related to (16) just as (13) is related to (14).

(15) *They're awful those prices.

(16) Those prices are awful.

But if price in (9) is pluralized, then in my speech, the noun phrase extraposition rule derives (17), not (18).

(17) It's awful the prices you have to pay for tomatoes in the winter.

(18) *They're awful the prices you have to pay for tomatoes in the winter.

In other words, dislocation requires number agreement on the "place-holding" pronoun, but noun phrase extraposition does not.

Fourth, in dialects which accept (13), (15) and (18), if the dislocated NP is [+HUMAN], the pronoun shows gender agreement.

(19) That girl is beautiful.

(20) *She's beautiful that girl.

(21) **It's beautiful that girl.

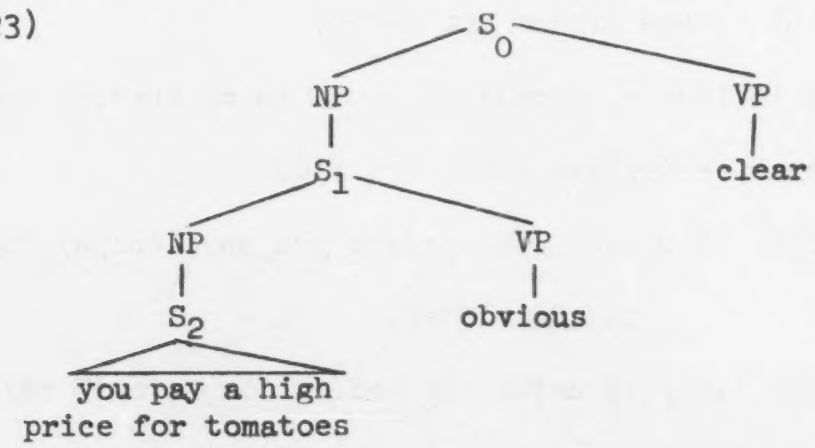
Thus there are several reasons for making a distinction between the rule that derives (5)-(8) from (9)-(12) and the dislocation rule that derives a superficially similar sentence type. The remainder of this chapter will illustrate further the distinctive characteristics of the former rule.

To repeat, the claim that I wish to make is that sentences (5)-(8) are derived from the structures underlying (9)-(12) by a rule which extraposes noun phrases (of a highly restricted sort, as will be seen later) around predicates (also of a highly restricted sort). Sentence extraposition is an iterative rule, as shown by (22).

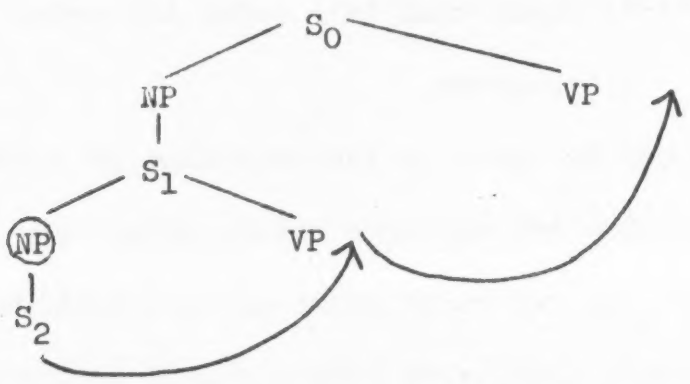
(22) It's clear that it's obvious that you pay a high price for tomatoes.

(22) is derived from a deep structure roughly like (23).

(23)

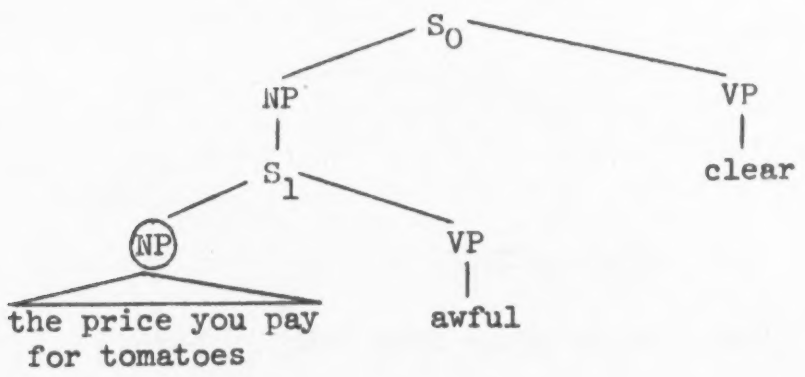


First, S_2 is extraposed around the predicate of S_1, then S_1 is extraposed around the predicate of S_0, as shown below:



It appears, however, that if, in a structure like this, the circled NP does not dominate S, no noun phrase extraposition is possible. For example, consider (24).

(24)



By my proposal, S_1 is the structure underlying (25).

(25) It's awful the price you pay for tomatoes.

From (24), I can derive in my speech (26), without extraposition, or (27), with extraposition.

(26) That the price you pay for tomatoes is awful is clear.

(27) It's clear that the price you pay for tomatoes is awful.

However, (28), by NP extraposition in S_1 and without sentence extraposition, is impossible.

(28) *That it's awful the price you pay for tomatoes is clear.

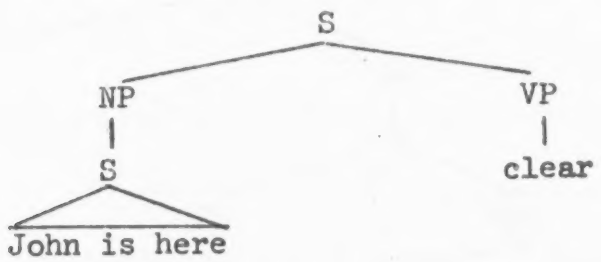
(29), by NP extrapositon and sentence extraposition, is somewhat better, perhaps, but still highly questionable.

(29) ?*It's clear that it's awful the price you pay for tomatoes.

These facts may be taken to indicate that NP extraposition and sentence extraposition are separate rules, since they are incompatible. On the other hand, the two rules share an important characteristic. It was pointed out above that, even with a plural head noun, NP extraposition leaves behind it, singular, not they, plural. (Cf. (17) and (18).)

From (30), we can derive (31).

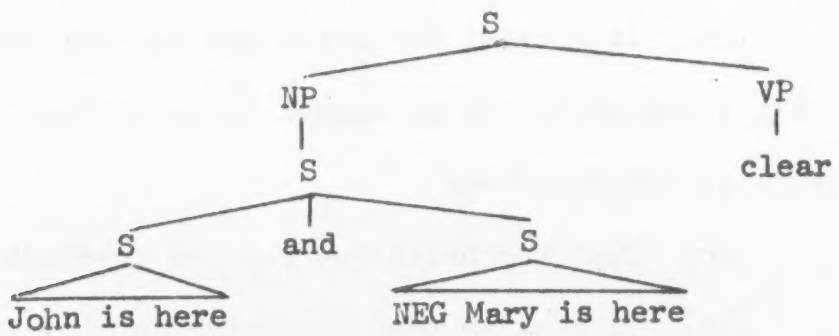
(30)



(31) It is clear that John is here.

But (32) yields (33), not (34).

(32)



(33) It's clear that John is here and Mary isn't.

(34) *They're clear that John is here and Mary isn't.

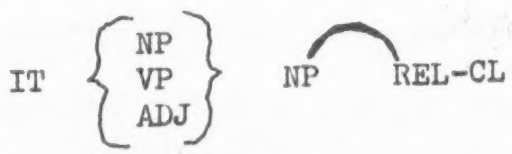
This is true despite the difference in verb agreement between (35) and (36).

(35) That John is here is a fact that we must take into consideration.

(36) That John is here and Mary isn't are facts that we must take into consideration.

That is, in both NP and sentence extraposition, the subject-place-holding pronoun is it, regardless of the number of the extraposed constituent.

The example sentences (5)-(8) all have approximately the following form:



As Langendoen (1969) notes, in (5) the adjective cannot be high. A sentence like (5) with high instead of awful is ungrammatical in both Langendoen's dialect and mine, although I presume that it is acceptable to speakers who accept (13), (15), etc. He says further that the class of nouns, adjectives and verbs that may appear as head in this construction can be specified semantically. This class is made up of the exclamatory predicates. Note the following examples.

(37) *It's a good thing the way he behaves when he's drunk.

(38) It's a shame the way he behaves when he's drunk.

(39) *It's vital the amount of weight I've lost since I started on that diet.

(40) It's wonderful the amount of weight I've lost since I started on that diet.

(41) *It amuses me the size dress my neighbor wears.

(42) It infuriates me the size dress my neighbor wears.

(37), (39), and (41) are all grammatical without extraposition.

(43) The way he behaves when he's drunk is a good thing.

(44) The amount of weight I've lost since I started on that diet is vital (to my health).

(45) The size dress my neighbor wears amuses me.

These examples are sufficient to demonstrate that there is a transformation which extraposes noun phrases around exclamatory predicates. In what follows, I will discuss some particular features of this rule.

First, it appears that only the definite article is allowable.

(46) *It's awful a price I paid for tomatoes last week.

Second, I have so far been able to find no examples of concrete head nouns that are allowable here.

(47) *It's amazing the twenty pounds I've lost since I started on that diet.

(48) *It never ceases to amaze me the dress my neighbor wears.

(49) *It's beautiful the house he lives in.

Again, all of these are grammatical without extraposition.

(50) The twenty pounds I've lost since I started on that diet is amazing.

(51) The dress my neighbor wears never ceases to amaze me.

(52) The house he lives in is beautiful.

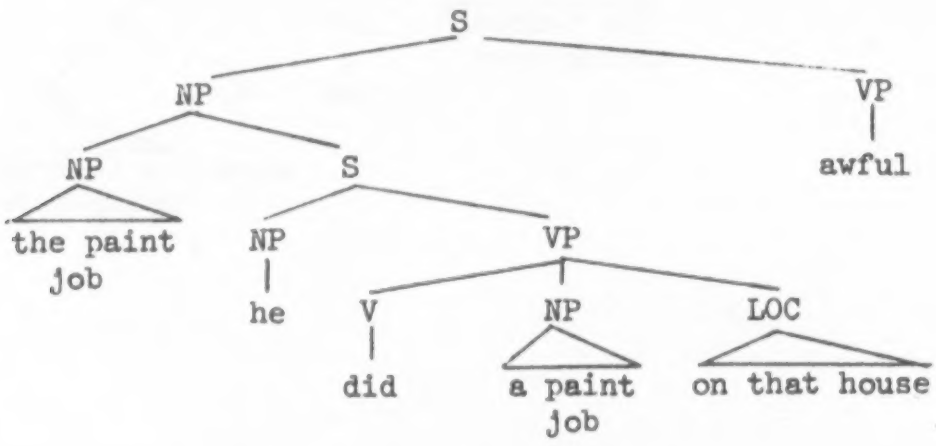
As noted above ,the extraposed NPs in (5)-(8) etc. are in fact NPs with relative clauses. It appears that, in some dialects at least, the head noun cannot have functioned as subject or indirect object in the relative clause sentence. Consider the following:

(53) It's awful the paint job he did on that house.

(54) The paint job he did on that house is awful.

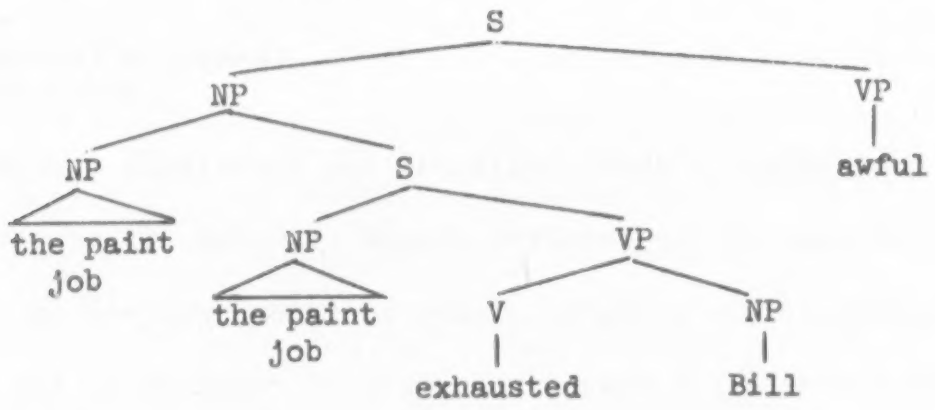
(53) is derived by NP extraposition from the same deep structure as (54).

(55)



Note that a paint job is direct object in the relative clause. The same NP can be subject in a relative clause.

(56)



(57) can be derived from this deep structure, but not (58).

(57) The paint job that exhausted Bill was awful.

(58) *It was awful the paint job that exhausted Bill.[3]

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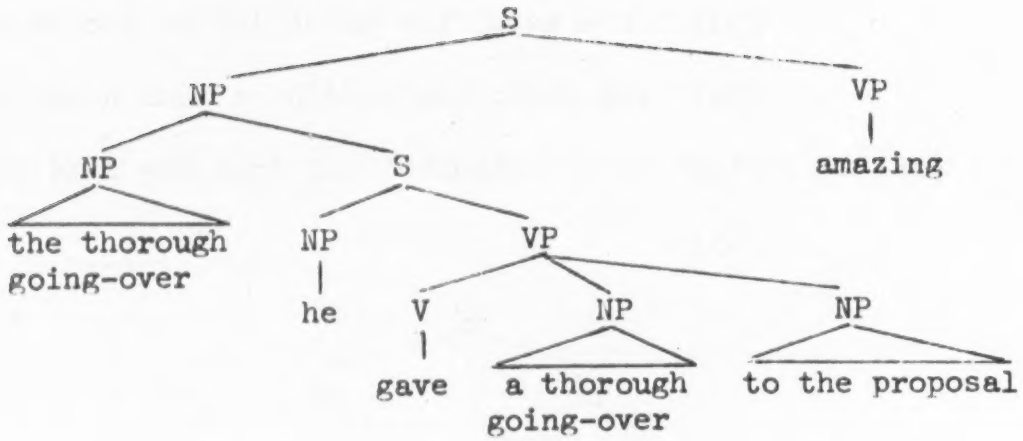
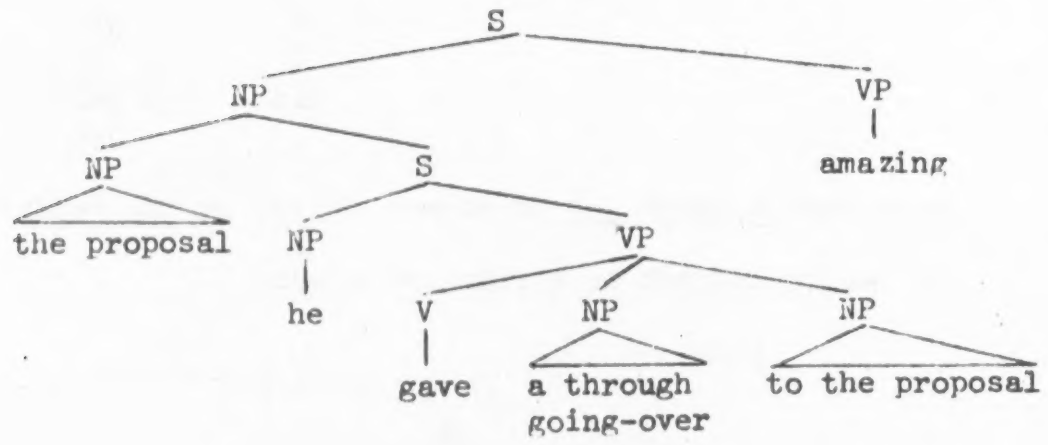
[3]It is perhaps worth noting that the abstract nouns that can occur in this construction are obviously not a severely limited set like, for example, those that take noun phrase complements, such as story, claim, and so on.

Nor can the abstract noun be a deep-structure indirect object. Consider the following structures:

(59)



(60)



These (almost) deep structures are identical, except that in (59) the head noun of the relative clause structure is repeated as the direct object of the relative clause sentence, whereas in (60) the head noun of the relative clause structure is repeated as the indirect object of the relative clause sentence. From (59), we can derive (61), and from (60), we can derive (62).

(61) The thorough going-over that he gave to the proposal was amazing.

(62) The proposal that he gave a thorough going-over to was amazing.

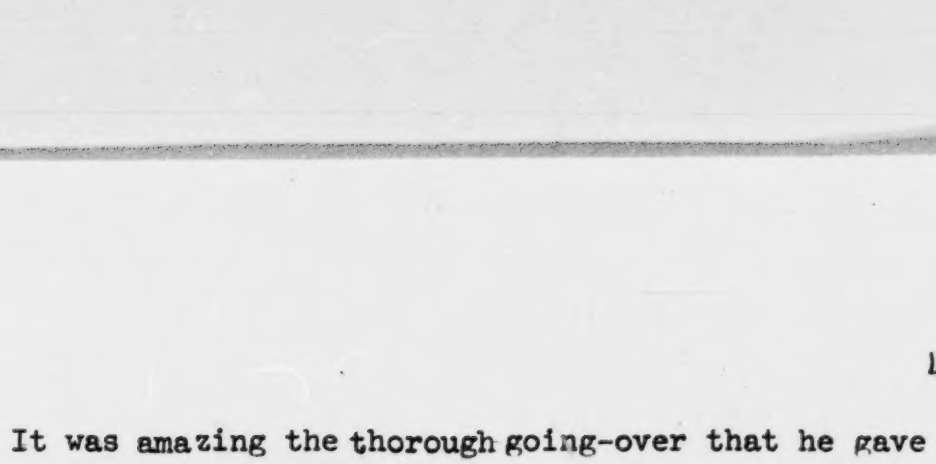
NP extraposition can be applied to (59) to produce (63), but I find completely ungrammatical sentence (64), derived by NP extraposition from (60).

(63) It was amazing the thorough going-over that he gave to the proposal.

(64) *It was amazing the proposal that he gave a thorough going-over to.

These examples provide evidence that the head noun of the extraposed NP can be neither the subject nor the indirect object of the relative clause. Of the original examples given above, (5), (7) and (8) exhibit this restriction. In (6), however, the head noun apparently is repeated not as direct object in a relative clause, but in an adverb phrase. That is, the deep structure of (6) is something like (65).

(65)

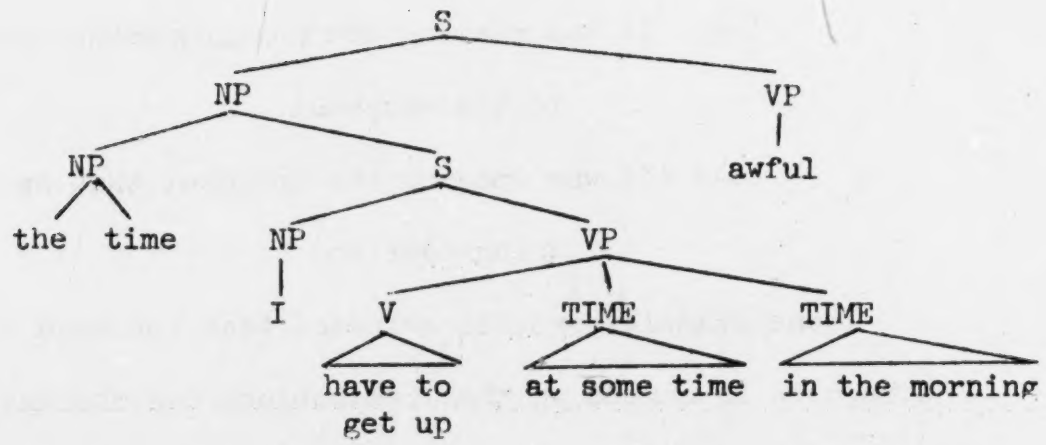


The situation with respect to head nouns from adverb phrases is not altogether clear as yet. I find (66) to be grammatical, although not everyone else does.

(66) (?) It's awful the time I have to get up in the morning.

(66) is presumably derived from the deep structure (67).

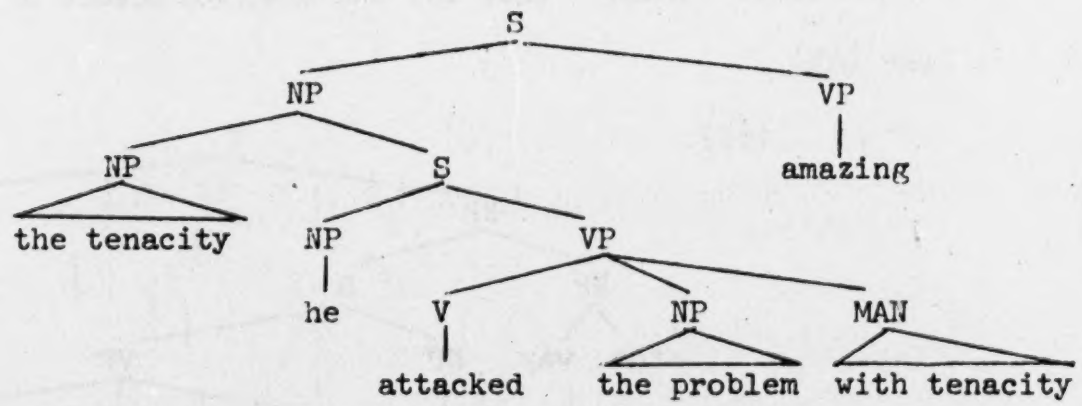
(67)



I also accept (68), derived from (69).

(68) It's amazing the tenacity with which he attacked the problem.

(69)



To summarize what has been said so far, it appears that the construction being considered is a type of noun phrase extraposition possible only in sentences where two conditions obtain:

1. the sentence must have a subject consisting of a definite abstract noun modified by a relative clause in which the head noun is repeated as the direct object of the relative clause sentence or in certain types of adverb phrases;

2. the predicate of the main sentence must contain a noun, verb or adjective of the exclamatory class.

It is not surprising that one of the restrictions on this construction should be that the predicate of the main sentence must contain an

exclamatory noun, adjective or verb, since this semantic class has already been shown to correlate with other syntactic processes. The other restrictions are somewhat less convincing. I presented them as I did because they hold in my own dialect. It appears, however, that some interesting dialect variation exists. Arnold Zwicky has provided the following examples, which for him are grammatical.

(70) It was awful the paint job that greeted Bill when he arrived.

(71) It was awful the sort of stuff that filled the wagon.

I find both of these ungrammatical, but a complete account of the NP extraposition transformation will of course require a statement of the variation shown across speakers.

One might argue that the grammaticality in some dialects of sentences like (70) and (71) indicates that the restriction on this transformation is not to direct objects and NPs from certain types of adverbials, but rather against the major case roles, as defined in Fillmore's theory of case grammar (1968), such as Agent, Experiencer, Instrument, etc. Anyone whose dialect contained such a restriction would find (70) and (71) grammatical, but would still not allow (58).

(58) *It was awful the paint job that exhausted Bill.

However, the restriction as I stated it for my own dialect additionally requires that the head noun be abstract. This rules out Agents and Experiencers automatically, since they must be animate, and hence concrete. Zwicky has also stated (personal communication) that the following sentences are at least marginally grammatical in his speech.

(72) It was awful the dreams he was haunted by.

(73) It was awful the method they used to destroy him.

For a dialect in which these sentences are grammatical, Instruments must be removed from the above list of excluded cases. But even in such dialects, I suspect that, although (74) would be grammatical, (75) would not be.

(74) It was fantastic the intense emotion with which the actor captured the attention of his audience.

(75) *It was fantastic the modern surgical tool with which the doctor cured my rheumatism.

Even here, the restriction to abstract nouns would hold.

C. SOME POSSIBLE COUNTEREXAMPLES

I will discuss now some possible counterexamples to the claims I have made for my own dialect.

The relation between (76) and (77) has been accounted for.

(76) The way he plays that concerto is brilliant.

(77) It's brilliant the way he plays that concerto.

In addition, a reason has been offered why (79) cannot be derived by NP extraposition from the structure underlying (78).

(78) The girl he married is brilliant.

(79) *It's brilliant the girl he married.

It appears, at first glance at least, that (80) and (81) are counter-examples to my proposals.

(80) The girl he married is awful.

(81) It's awful the girl he married.

Now if (81) is related to (80) as (79) is related to (78), the credibility of my proposals is weakened considerably, since the head

noun is in each case concrete. However, whereas (76) and (77) are for me synonymous, (80) and (81) are not, and other speakers whom I have questioned who accept (81) agree with me. The semantic difference between (80) and (81) is unfortunately rather subtle, but apparently clear enough to those who accept (81). (81) means, roughly, "It's awful that he married the girl he married." Perhaps (82) will make this clearer.

(82) It's amazing the girl he married.

This, I think, would be taken to imply that one would not have expected him to marry such a girl. (83), on the other hand, could not be used with this meaning.

(83) The girl he married is amazing.[4]

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[4]This is shown even more clearly in the sentence "He married an amazing girl" which is at least semantically equivalent to (83), but is quite obviously not synonymous with (82) or (84).

Furthermore, if (82) is taken to be derived from the structure underlying (84),

(84) That he married the girl he married is amazing.

it becomes possible to account for the ungrammaticality of (79), on a reading analogous to that of (81), since (85) and (86) are also ungrammatical.

(85) *It's brilliant that he married the girl he married.

(86) *That he married the girl he married is brilliant.

In other words, the resemblance between (77) and (81) is purely a matter of surface structure, since the two sentences are in fact understood quite differently. (77) results from NP extraposition of

the type I have been discussing, but (81) is derived by a type of normal sentence extraposition. This type of sentence extraposition has its own peculiarities, however. It too seems to be conditioned by the presence of exclamatory predicates. Note the ungrammaticality of (87) and (88).

(87) *It's a good thing the girl he married.

(88) *It's important the girl he married.

(89) and (90), on the other hand, are both grammatical.

(89) It's a good thing that he married the girl he married.

(90) It's important that he married the girl he married (instead of someone else.)

I have no particular proposals to make about the underlying structures of such relative clause sentences. It would seem obvious, however, that there is a close relationship semantically between (90), and a sentence like (91).

(91) It's a good thing that he married that <u>particular</u> girl.

(91) is susceptible to an interpretation in which <u>that particular girl</u> means simply <u>the girl he married</u>.

It appears, then, that this type of exclamatory sentence extraposition also requires a relative clause on the head noun, but obviously it must be a particular type of relative clause. Note that (92) is well-formed, but not (93).

(92) It's awful that he decided to marry the girl who lives next door.

(93) *It's awful the girl who lives next door he decided to marry.

The relative clause, apparently, must simply duplicate the top sentence of the THAT-complement, which is then deleted. The following examples may indicate that it is in fact the complement sentence and not the relative clause sentence which is deleted.

(94) It's awful that he decided to marry the girl he decided to marry, who lives next door.

(95) *It's awful the girl, who lives next door, he decided to marry.

Presumably, (95) would result if the restrictive relative clause were deleted, then the object NP preposed, with deletion of that. However, I find (96) rather bad.

(96) ?It's awful the girl he decided to marry, who lives next door.

If (96) is rejected, then this argument is irrelevant.

This discussion had led up to a paradox the resolution of which is perhaps still problematic. I have proposed that, for example, (82) is derived, following sentence extraposition, from the deep structure underlying (84), both of which are repeated here, along with the intermediate stage.

(84) That he married the girl he married is amazing.

--→ (by sentence extraposition)

(84a) It's amazing that he married the girl he married.

--→ (by deletion)

(82) It's amazing the girl he married.

(77), on the other hand, was said to be derived from (76), by NP

extraposition.

(76) The way he plays that concerto is brilliant.

(77) It's brilliant the way he plays that concerto.

A derivation for (77) analogous to (84) → (84a) → (82) was rejected because of the ungrammaticality of the required source sentence, (97).

(97) *That he plays that concerto the way he plays that concerto is brilliant.

But consider (98) .

(98) It's amazing the way he plays that concerto.

A derivation for (98) analogous to (84) → (84a) → (82) cannot be rejected on the same grounds on which I rejected such a derivation for (77), because (99) is grammatical.

(99) That he plays that concerto the way he plays that concerto is amazing.

Perhaps it should be said that anyone considering the syntax of sentences (5)-(8) and similar examples, like (98), would probably never be led to consider such a derivation for (98) if he did not notice the existence of sentences like (82). Indeed, a linguist who did not accept (82) at all would certainly not consider such a solution.

I think, however, that there is a subtle but important difference semantically between (98) and (99), and that this distinction is sufficient to allow us to claim that (98) is derived not from (99), but from (100).

(100) The way he plays that concerto is amazing.

I am able to state the difference only in rather impressionistic terms, but it is simply that in (98) and (100), as they would ordinarily be

understood, amazing is predicated only of way, but in (99), this predication is on the entire complex sentential subject of is amazing. (98) and (100) would be appropriate comments on one of Sviatoslav Richter's customarily brilliant performances of a Beethoven concerto. But (99), even in a less awkward version with extraposition and pronominalization of the second occurrence of that concerto, would not be. Rather, (99) might be appropriate if Richter had played a concerto in an untypically bad manner.

CHAPTER THREE

THE FLIP RULE

A number of recent writers, including G. Lakoff (1970c), Chapin (1967), R. Lakoff (1968), and Postal (1970a, 1970b) have discussed, in various contexts, a rule which has the effect of placing a subject NP in the predicate of its sentence and moving a noun phrase in the predicate to grammatical subject position, in the presence of a restricted class of predicates. G. Lakoff and Chapin, calling the rule "flip," limited their discussion to sentences with emotive predicates. R. Lakoff and Postal, who uses the term "psych movement," extended the general process to a larger class of predicates. I will limit myself here to emotive sentences.

Each of the writers mentioned above used sentences of the type to be discussed here in the context of more general theoretical discussions, and thus left a number of important points unmentioned or only briefly touched upon. Furthermore, in Postal's case especially, conclusions have been arrived at on the basis of rather dubious grammaticality judgments. Thus, as has been the case in a disturbingly large number of recent grammatical studies, the analyses proposed lose a considerable amount of their force.

I will first review the comments made in the aforementioned publications, then present some facts which cast doubt on crucial

features of these analyses, along with some further observations.

A. PREVIOUS ANALYSES

Lakoff (1970c, pp. 126-127) discussed the "flip" rule as part of his attempt to provide evidence for the claim that adjectives and verbs are members of the same category, Verbal, and that they differ only with respect to their value for the feature[±VERB]. The apparent synonymy of sentences like the following, one containing an adjective, the other a verb, is taken as providing evidence for this claim.

(1a) What he did amused me.

(1b) I was amused at what he did.

(2a) What he did surprised me.

(2b) I was surprised at what he did.

Lakoff contends that the "flip" rule has applied to the (a) sentence in each pair, for two reasons. First, he claims, we know what the basic sentences are "...from our intuitions about what the underlying subjects and objects are..." (p. 126). Second, Lakoff maintains that the direction of derivation that he proposes is supported by the fact that "the underlying subject-object relation is unchanged under nominalization." That is, corresponding to the sentences above, we have:

(3) My amusement at what he did.

(4) My surprise at what he did.[1]

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[1]Chomsky (1970) discusses these examples also. He finds in them support for the "lexicalist hypothesis," and claims that only on this hypothesis does the solution proposed by Lakoff have any

motivation. But of course, this stands or falls with the lexicalist hypothesis itself.

Chapin (1967) has still another motivation for discussing the "flip" rule. He is concerned with the fact that, if, as Lakoff claims, the (b) sentences in (1) and (2) above underlie the (a) forms, we are faced with apparent violations of certain deep-structure like-subject constraints.[2] For example, given the direction of derivation

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[2]These and other such constraints are discussed in Perlmutter (1968).

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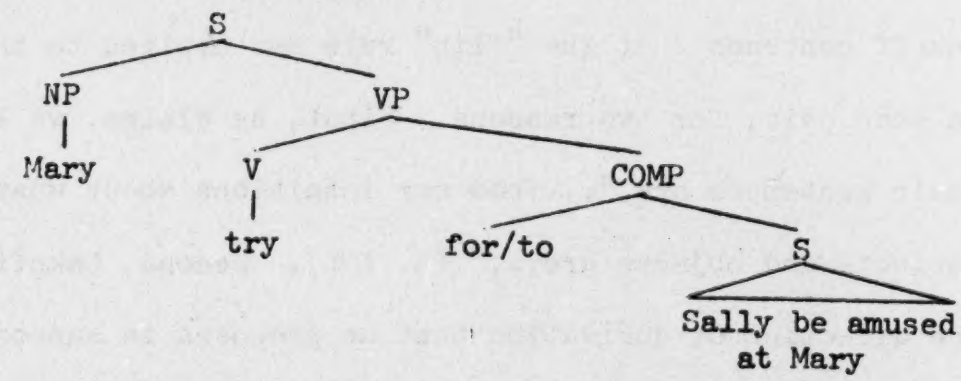
that Lakoff proposes, the following structure would have to be assumed to underlie sentence (5).

(5) Mary tried to amuse Sally.



But the verb <u>try</u> obeys the like-subject constraint, since (6) is ungrammatical.

(6) *Mary tried for Sally to be amused (at her).

However, the application of the "flip" rule to the embedded sentence creates an "amnesty" from the constraint (Chapin attributes this term to J. R. Ross), and (5) is grammatical.

As far as I am aware, it was Chapin who made the first real attempt to defend the existence of the "flip" rule. He claims that

sentences like (1) and (2) above are not variants of the passivé although this is "a common intuitive reaction" (p. 81). He offers two pieces of evidence in support of this. The first is that "passive and reflexive are mutually exclusive"(p. 81).[3] Since (7)

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[3]This was later assumed to be accounted for by the "cross-over principle." See Postal (1970b).

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is ungrammatical, but not (8), the latter cannot be a passive.

(7) *Henrietta was amused by herself.

(8) Henrietta was amused at herself.

Chapin's second argument depends on facts about co-occurrence with instrumental adverbs. His examples are (pp. 81-82):

(9) Jerry amused Irma with a harmonica solo.

(10) Irma was amused by Jerry with a harmonica solo.

(11) *Irma was amused at Jerry with a harmonica solo.

Chapin's point is simply that "Irma was amused at Jerry" cannot be a passive, because unlike true passives, it cannot oo-occur with instrumental adverbs.

R. Lakoff (1968) repeats some of the observations about "flip" sentences made by other writers, and offers some additional ones. She claims that the following two sentences are not synonymous (p. 38).

(12) I was surprised by John.

(13) I was surprised at John.

She proposes further that in the sentence

(14) I was surprised at you.

the you is actually a reduced form of what you did or something of that sort.

Postal (1970a, 1970b) was concerned with finding evidence for his "crossover principle" which, simply stated, says that no rule which reorders constituents may move one NP over another NP, if the two are coreferential. There are of course a number of obvious cases which argue for such a constraint. Postal provides what might conceivably be clear proof that sentences like (1b) and (2b) above are basic, and that the (a) forms are derived by "psych movement."

(15) Max disgusted me.

(16) Max was disgusting to me.

(17) I was disgusted with Max.

(18) Max disgusted himself.

(19) Max was disgusting to himself.

(20) I was disgusted with myself.

Postal marks (18) and (19) as ungrammatical, and thus can claim that (15) and (16) must be derived by "psych movement."

B. ADEQUACY OF THESE ANALYSES

The two pieces of evidence that Lakoff (1970c) provides for his contention that the "flip" rule has applied to the (a) forms in (1) and (2) above are both weak. He claims that the underlying sentences are obvious "... from our intuitions about what the underlying subjects and objects are...." My own intuitions about this are apparently not as strong as Lakoff's, and I do not see how such a statement can be used as evidence one way or the other.

Lakoff's second claim, that "the underlying subject-object relation is unchanged under nominalization" is not an obviously valid argument, since it seems to assume that nominalizations typically

reflect underlying order. But in the face of an example like "the Archduke's assassination by a Serbian radical," this cannot be maintained.

The arguments given by Chapin (1967) arrive at the proper conclusion, but by a misleading route. He wishes to argue that sentences like (1b) and (2b) above cannot be variant forms of passive sentences. But even a consideration of this possibility rests on a false assumption, which Chapin does not mention.

(21) and (22) are both grammatical, lending initial support to the possibility that they are both passives.

(21) Henrietta was amused by Bill.

(22) Henrietta was amused at Bill.

Chapin argues that (7) is ungrammatical because "passive and reflexive are mutually exclusive," and that therefore neither (8) nor (22) can be passives, because they are both grammatical.

(7) *Henrietta was amused by herself.

(8) Henrietta was amused at herself.

But if (21) and (22) were variants, their common deep structure would have to be that underlying (23).

(23) Bill amused Henrietta.

The crucial fact is that (23) is ambiguous, and (22) corresponds to only one reading. Consider the following pair of sentences.

(24) Bill amused Henrietta by wearing a lampshade on his head.

(25) Bill amused Henrietta by forgetting to tie his shoelaces.

The ambiguity of (23) lies in the fact that the action may be interpreted as purposeful or as non-purposeful. Since one can wear something on purpose, but cannot forget something on purpose, we may conclude that (23) is ambiguous as described.

It seems clear that although (21) retains this ambiguity, (8) and (22) do not. That is to say, (8) and (22) can only be interpreted as not involving purpose. The ungrammaticality of (26) might be taken as evidence for this.

(26) *Henrietta was amused at herself by listening to a Bill Cosby record.

But (27) is also ungrammatical.

(27) *Henrietta was amused at herself by forgetting to tie her shoelaces.

Apparently, the availability of by-clauses here is conditioned by the surface form of the main clause. Notice that both (28) and (29) are grammatical.

(28) Henrietta was amused at herself for listening to a Bill Cosby record.

(29) Henrietta was amused at herself for forgetting to tie her shoelaces.

But now the "listening" in (28) is no longer interpretable as a purposive action, at least not for the specific purpose of amusement. I have at present no explanation for the ungrammaticality of sentences like (27). The relevant point here, however, is that sentences like (23) are ambiguous, whereas sentences like (22) are not.

The purpose of this discussion was to show that Chapin's argument with respect to sentences like (21), (22) and (23) is

misleading, since (21) and (22) could not possibly be considered to be simply "variants" of each other. The second point of his argument that sentences like (22) are not passives is faulty for similar reasons. If (21) and (22) could not be simply variants, because (21) and (23) are ambiguous, but (22) is not, then there is no more point in arguing from cooccurrence with instrumentals than there is in arguing from the mutual exclusiveness of passives and reflexives.

As I have said, the arguments given by Postal (1970a, 1970b) might be convincing proof of the derived nature of sentences (1a) and (2a) above. But his conclusions are highly suspect, because they are not based on clear facts about grammaticality and ungrammaticality. His argument depends on the ungrammaticality of (18) and (19). I find them acceptable, and it has not been at all difficult to find other (linguistically trained) speakers who agree. Thus, for anyone who finds (18) and (19) acceptable, Postal's arguments can have no force.

Of all the observations made on "flip" sentences by the writers that have been mentioned, Postal's would no doubt be the most convincing, if they were based on persuasive judgments about grammaticality and ungrammaticality. But they are not. Postal himself (1968) has investigated (apparently quite informally) some instances of dialect variation with respect to crossover phenomena,[4]

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[4]Labov (1970) reported that he and his co-workers, after extensive investigation, were unable to identify dialect variation patterns like those found by Postal.

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but in Postal (1970a) he merely noted that although there might be

some disagreement about his grammaticality judgments (this was rather an understatement), he was sure that everyone would agree with enough of his examples to be convinced of the correctness of his analysis (p. 39). But the status of (15)-(20) is entirely fundamental to the analysis, more so than many of his other examples.

It is, of course, eminently satisfying to find evidence for a very general constraint like the crossover principle in widely scattered areas of English syntax. But here, at least, our joy cannot be complete, for there is no agreement on the basic data. Thus we must content ourselves with an analysis weaker than one based on clear facts, or else shift our ground, and concentrate precisely on the observed variation.

R. Lakoff (1968), some of whose comments on "flip" sentences have been quoted above, accepts the proposals made by the other writers for the basic structure of these sentences, but the quoted comments, although merely programmatic and quite brief, do contain what I think are basic insights necessary for an adequate analysis of these sentences.

Mrs. Lakoff notes that (12) and (13), repeated below, are not synonymous.

(12) I was surprised by John.

(13) I was surprised at John.

It should be obvious from the discussion above that the recognition that (12) and (13) are not synonymous is what renders irrelevant any attempts to show that (13) is not a passive. This non-synonymy is in fact explained by regarding "John" in (13) as the reduced

form of a complement sentence. I will expand further on these points below.

C. FURTHER REMARKS AND IMPLICATIONS

I think we can conclude that there is in fact little or no real evidence that sentences like (30) can be taken to be closer to an underlying form than sentences like (31).

(30) Frances was frightened at Geraldine.

(31) Geraldine frightened Frances.

In this section, I will outline an alternative analysis, and make some additional general comments on the issues raised by "flip" sentences.

One of the fundamental facts brought out above is that a sentence like (23) is ambiguous as to whether the "action" denoted is purposeful or non-purposeful.

(23) Bill amused Henrietta.

A few recent studies have touched upon the problem of sentences that are ambiguous in this way. Notice that sentence (9) shows this ambiguity, despite the presence of what appears to be an "instrumental adverb." On one reading, and only on one reading, (9) can be paraphrased by (32).

(9) Jerry amused Irma with a harmonica solo.

(32) Jerry used a harmonica solo to amuse Irma.

Lakoff (1968) has proposed that sentences like (32) typically paraphrase sentences with instrumental adverbs, like (9). Of course, this is a very general fact. Lakoff's original examples were the following:

(33) Max cut the salami with a knife.

(34) Max used a knife to cut the salami.

He points out that (33), unlike (34), is ambiguous as between what he calls the "accidental" and "purposive" senses and concludes tentatively that the two senses must have distinct underlying structures. Although Lakoff's terminology may not be entirely appropriate, we are dealing here with essentially the same distinction.

The problem of the deep structure representation of purpose has been studied by Lee (1970), who attempts to provide a far more general account than is possible here. His conclusion is that sentences which express purpose are <u>configurationally</u> defined as having deep structure subjects, and conversely, that sentences which do not express purpose are subjectless in deep structure. At present, I am in agreement with Fillmore (1970), who holds that such an approach is not in fact distinct from an approach, such as his own case grammar, which labels deep structure NPs for different roles. I take this to mean that a sentence like (35) would be <u>configurationally</u> the same on both its readings.

(35) Bill amused Jack.

But regardless of how it is decided to <u>represent</u> purpose, sentences like (35) are of interest for two reasons. First, (35) is paraphrasable by "Jack was amused at Bill" only on the purposive reading, and this provides evidence that purpose must be taken account of. Second, what is particularly relevant here, only emotive predicates allow such paraphrases.[5]

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[5]It is interesting to note that some verbs are ambiguous such

that one interpretation is "metaphorically" emotive. For example, injured in (i) cannot be interpreted literally.

(i) Wendy was injured at your remarks.

The same is true of sickened in (ii).

(ii) Mervin was sickened at her actions.

The discussion of Chapin's comments provided some idea of the problems involved in dealing with the "flip" rule. However, they were perhaps misleading in one sense, since all the example sentences had human subjects. This is not always the case, however.[6]

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[6]Chapin does discuss the verbs benefit and profit, which are apparently "flip" verbs, and which take nouns like experience.

(i) The experience profited John.
(ii) John profited from the experience.

My own initial reactions, at least, indicate that sentences with profit receive an atypical interpretation. Suppose that this verb has both a "literal" interpretation, meaning "financial profit," and a "metaphorical" interpretation. I allow both these meanings for (iii).

(iii) John profited from the stock market.

But only the metaphorical interpretation is possible for (iv).

(iv) The stock market profited John.

This does not seem to be in accord with the observations made about the other examples. However, my reactions are not entirely clear-cut, and I would therefore hesitate to depend on them very heavily.

The notion of ambiguity as between a purposeful versus a non-purposeful interpretation of a sentence presumably makes sense only when we are dealing with human, or at least animate, subjects. But of course, non-animate nouns can occur as subject in sentences like (35).

(36) The book amused John.

Given the case framework of Fillmore (1968), (36) could presumably be derived by the subjectivalization of an instrumental complement.

This would be compatible with Fillmore's definition of instrumentals: "the case of the inanimate force or object causally involved in the action or state identified by the verb" (1968, p. 24).

It has been pointed out, e.g. by Stockwell et al. (1968, p. 10), that this analysis lumps together under the Instrumental case a number of semantically disparate subject types. Although this is clearly an unsatisfactory situation, I am not aware of any proposed alternatives.

Fillmore proposes that if there is an Agent in any given underlying structure, it typically becomes the surface subject, and if there is an Instrument, but no Agent, then the Instrument becomes the subject. On this account, as I understand it, sentence (37) comes from a deep case structure which contains, inter alia, an Instrument but no Agent.

(37) The plane carried the tourists to Acapulco.

"The plane" in (37) is not an Agent, because Agents are defined as being animate. Why are Agents defined as being animate? Because we know, not from our language, but from our "knowledge of the world," that inanimate objects do not do things on their own, so to speak. Agents and Instrumentals, as subjects, do not in general enter into different syntactic constructions. Thus the decision to label one

NP as Agent and another as Instrument is made on purely semantic, or in this case, perhaps pragmatic grounds.

It seems that the obvious next step is to say that Instruments can occur only in deep case structures where there is also an Agent. A number of things follow from this. We can of course show the relationship between (38) and (39).

(38) John hit Marsha with a baseball bat.

(39) A baseball bat hit Marsha.

We can also show that (40) is not related to a sentence like (38), which would provide for the oddity of (41).

(40) A baseball bat hit Marsha when it fell off the shelf.

(41) *John hit Marsha with a baseball bat when it fell off the shelf.

That is, a baseball bat in (40) would not be a deep Instrument, but some as yet unnamed case.

Furthermore, for many speakers, including me, (42) can be related either to (38) or to (40), but (43) can be related only to (40). Finally, this would imply that (39) is in fact ambiguous, which is certainly not very far off the mark, if at all.

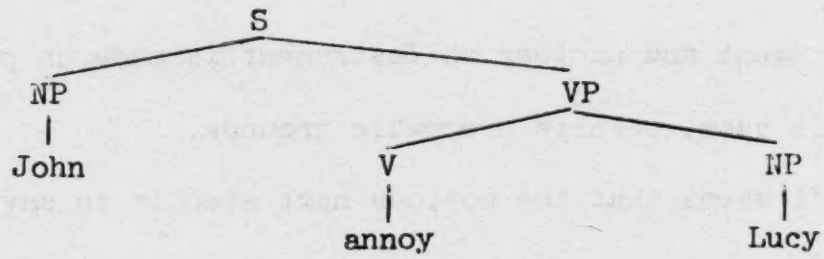
(42) Marsha was hit with a baseball bat.

(43) Marsha was hit by a baseball bat.

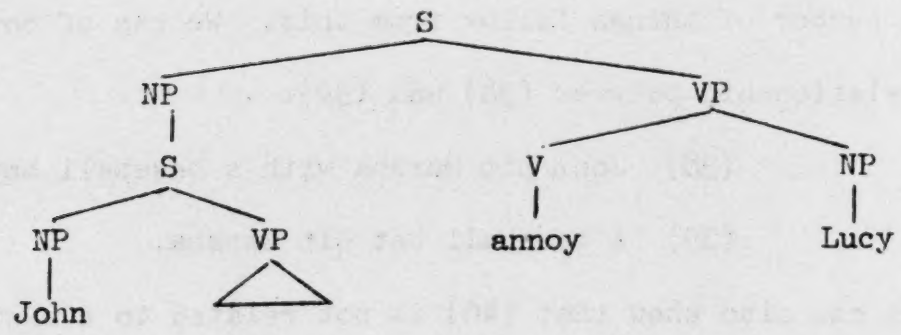
These programmatic remarks have implications that go beyond the limited topic considered here, but, if they lead in the right direction, allow us to look for a somewhat more comprehensive analysis. Let us propose that the purposive and non-purposive readings of sentence (44) correspond respectively to the structures of (45) and (46).

(44) John annoys Lucy.

(45)



(46)



The "flip" rule, if indeed it can be stated formally, will be applicable only to structures like (46). Thus, of course, we reflect the observation of R. Lakoff that in a sentence like "Lucy is annoyed at John," John is in fact interpreted as a reduced form of something like "what John does," which I think is essentially correct. Certainly, (44) on the non-purposive reading can in many contexts be paraphrased by (47).

(47) What John does annoys Lucy.

However, this is not always the case, since it might be, for example, that it is John's appearance, and not his actions, that annoy Lucy. It is possible that the unspecified predicates in structures like (46) can be limited to some large but finite class, and thus the VP in (46) can be realized as an "abstract" verb, representing the members of this class.[7]

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[7]Such an analysis might proceed along the lines suggested by Newmeyer (1970) in his analysis of some uses of begin.

This accounts for (44) on both interpretations, and for (48), which is synonymous with one interpretation of (44). The structure shown in (45) can of course be passivized to yield (49).

(48) Lucy is annoyed at John.

(49) Lucy is annoyed by John.

As I have pointed out, R. Lakoff has noted that (12) and (13) are not synonymous.

(12) I was surprised by John.

(13) I was surprised at John.

It is at least true that (12) has one reading that (13) does not have. However, for many speakers, (12) <u>can</u> be synonymous with (13). That is, (12) has two readings, one of which is the same as that of (13), which presumably has just one.

There are many cases where several prepositions are possible in a sentence like (13) with no appreciable meaning difference. This appears to be in general a lexical matter. (However, I will discuss below a case where the particular preposition is important.) For example, (50) is fine, but (51) not obviously so.

(50) I was annoyed with John.

(51) ?*I was surprised with John.

Suppose then that (49) is <u>either</u> a straight passive, derived by application of the passive transformation to (45), <u>or</u> synonymous with (48). Then the question is, can the passive rule apply as well to (46), with deletion of the unspecified VP, or is (49) also the result of the "flip" rule, with a non-meaning-bearing choice of preposition? The existence of a particular class of emotive verbs leads us to choose the latter alternative. Verbs such as

amaze, disgust, elate, flabbergast, and outrage apparently do not allow agents, and thus cannot appear in structures like (45). This is shown by the ungrammaticality of (52) and (53).

(52) *John deliberately amazed Harold.

(53) *I persuaded Henry to flabbergast Eleanor.

But these verbs do appear in the "flip" form with both at and by.

(54) Harold was amazed { at / by } John.

(55) Eleanor was flabbergasted { at / by } Henry.

Since (48), and (49) on an interpretation synonymous with (48), seem quite analogous to (54) and (55), it seems most revealing to treat (49), on its reading synonymous with that of (48), as being derived by the "flip" rule.

As the above discussion suggests, "flip" sentences are subject to a number of lexical constraints. For example, apparently only interested allows the preposition in. However, sentences with about, in some dialects at least, are interpreted in a particular way. Consider sentences (56) and (57).

(56) Carol is annoyed about Joe.

(57) Lester is frightened about Beulah.

It is immediately obvious that (56) and (57) are not paraphrased by sentences with at or with.

(58) Carol is annoyed at Joe.

(59) Carol is annoyed with Joe.

(60) Lester is frightened at Beulah.

(61) *Lester is frightened with Beulah.

Furthermore, (62) and (63) are also not paraphrases of (56) and (57).

(62) Joe annoys Carol.

(63) Beulah frightens Lester.

Notice that (57) is essentially paraphrased by (64).

(64) Lester is frightened about Beulah's situation.

But (57) is not paraphrasable by (65).

(65) Lester is frightened about Beulah's hairdo.

Thus it appears that sentences like (56) and (57) are understood as having been derived by the deletion of some indefinite predicate on the NP following about. Notice that (57) can be paraphrased by (66).

(66) Beulah's situation frightens Lester.

But again, (67) can be related only to (68), not to (65).

(67) Beulah's hairdo frightens Lester.

(68) Lester is frightened at Beulah's hairdo.

There are apparently a number of nouns that can substitute for situation in this sort of paradigm, for example, problems, trouble, predicament, actions, etc., a fairly large set of almost "contentless" nouns.

The important point, then, to give another example, is the fact that, in some speech styles at least, (69) and (70) are synonymous, but (72) is synonymous with neither.

(69) I am worried about my car.

(70) My car's situation worries me.

(71) My car worries me.

For example, (69) and (70) would be appropriate if my car were being worked on by an inept mechanic, and (71), if it were making strange noises, but not vice versa.

Of course, the abstract nouns listed are by no means synonymous with each other. Thus the forms underlying sentences like (57) must be of the form "Beulah's NP frightens Lester" where the NP can be any of a large but limited set of abstract NPs.

There are, of course, a number of what appear to be largely idiosyncratic facts about "flip" sentences that have been left untouched. I have attempted to show that much of the earlier discussion of these sentences has been either misleading or based crucially on extremely doubtful grammaticality judgments, and to provide an alternative treatment based in part on facts which, so far as I know, have not before been treated in print.

CHAPTER FOUR

CONCESSIVE CONSTRUCTIONS

I will deal here with a set of constructions in English which I will refer to as "concessives". These constructions are defined morphologically by the occurrence of WH-forms with -ever, such as whoever , whatever, etc. I will restrict myself here to sentences with whoever, but the discussion can easily be extended to the other forms, since the surface form depends simply on the nature of the underlying NP, whether Human, non-Human, Locative, Temporal, etc.

The term "concessives" is chosen because it has been used by some of the traditional grammarians who have remarked on these forms. A brief survey of some of their observations appears below. These constructions have never to my knowledge been considered by transformational linguists.

A study of concessive constructions is relevant to the general purposes of this study because these constructions, in some and perhaps all of their uses, provide another example of a syntactic construction whose primary purpose is to indicate an emotive judgment. I will discuss concessives as they appear in two major syntactic roles: as subject, object or indirect object complements, and as sentence adverbials. Following are a few example sentences. (1) and (2) illustrate subject complements, (3) an object complement, and (4), a sentence adverbial.

(1) Whoever painted that picture is a genius.

(2) Whoever disrupts college classes should be jailed.

(3) We want to talk to whoever wrote that book.

(4) Whoever reached the New World first, Christopher Columbus is the man who is remembered.

The claim that concessive constructions have an emotive function is based in part on intuition, as are judgments about the semantic properties of other constructions or of particular words, and in part on paraphrase relationships. There are, however, a number of general comment that need to be made in order to place the analysis of concessives in perspective. I will therefore reserve specific comments about the emotive function of concessives until after a more general survey of their propert

As I said above, I am unaware of any writings on concessives by transformationalists. Earlier grammarians, however, have made a number of comments. I will first give a brief sample of these comments, and then proceed into my own analysis of concessives, which will be divided into three main sections: 1) the syntactic characteristics of concessives, 2) the semantic facts about concessives which account for their syntactic behavior, and 3) some speculations on the underlying syntactic representation of concessive constructions.

A. ANALYSES BY TRADITIONAL GRAMMARIANS

Jespersen (1964) offers the most comprehensive treatment of concessives among the traditional grammarians. In his Essentials of English Grammar, he gives the following examples (p. 353):

(5) Who steales my purse steales trash.

(6) Whoever says so is a liar.

(7) Whatever I get is at your disposal.

(8) You may marry whom you like.

(9) He wants to shoot whoever comes near him.

(10) He will eat whatever he sets his heart on.

(11) You may dance with whom you like.

(12) He will shoot at whoever comes near him.

Jespersen considers these constructions to be a type of relative clause. Thus in (5)-(7), the "relative clause is the subject," and so on. He notes that (5) has "for centuries been archaic only," and of course whom in (8) and (11) would in contemporary English be replaced by who(m)ever.

Jespersen begins his commentary with the following:

> In all these sentences it is the relative clause itself in its entirety that is the subject or object. It would not do to say that in [5] who stands for he who, and that he is the subject of (the verb in) the main clause, and who that of the relative clause, for the supposition of an ellipsis of he is quite gratuitous--and in many of the sentences quoted it would be impossible to insert any pronoun that would give sense and that might be said to have been omitted.
>
> The correctness of this analysis, which makes the whole clause the subject, etc., is brought out clearly when we consider those cases in which a clause which is itself the object of a preposition contains a preposition having for its object the relative pronoun:
>
> To take a note of what I stand in need of. (Sh[akespeare])
>
> I had been writing of what I knew nothing about. (Ruskin)

Jespersen makes only one relevant semantic comment here. He says, "While what is used very extensively in clause primaries, the same is not true of who. ...There is, however, one condition on which similar clauses may be used in natural speech, namely, that

the meaning is distinctly generic and that indifference of choice is expressly indicated." He refers to sentences like (4) or

(13) He abuses whoever crosses his path.

The exclusion in the quotation is in reference to sentences like

(14) *He abuses whom he knows.

which Jespersen notes are inadmissible.

In A Modern English Grammar (1954), of which Essentials of English Grammar is a shortened version, Jespersen makes a few somewhat more explicit statements. The quotation directly above from Essentials of English Grammar is taken almost verbatim from this work. But here Jespersen adds a most contemporary-sounding observation when he notes that the "generic meaning" or "indifference" may be expressed "...by such a verb as choose, please, like, would in the clause itself [cf.] no matter who)." And then, "The parallelism between these two idioms, and, in fact, the peculiarity of the latter kind of clauses, have never [ca. 1927] been noticed by grammarians, so far as I know." (Vol. III, p. 62).

Later, Jespersen notes that whoever, whatever, etc. are, in "ordinary grammars...given as a separate class, termed indefinite relative pronouns." He does not accept this classification, however. "There is...no reason why they should be set up as a class by themselves; they are not more indefinite in their meaning than the simple who or what...: the really characteristic trait of the clauses introduced with -ever is that they are not adjuncts as are most relative clauses." (1954, p. 62).

Curme (1931), in Volumes II and III of A Grammar of the English Language, establishes himself as an "ordinary grammarian" by his use

of the term indefinite relative, but makes no very helpful observations.

Ralph B. Long (1961), author of The Sentence and its Parts, makes roughly the same comment as Jespersen: "Often whoever expresses indifference to identity in a way that relates it semantically to anyone and no matter." (p. 372).

R. W. Zandvoort (1962), in his brief comments on concessives, decides that whoever, whichever, etc., are "very indiscriminate in meaning." (p. 166).

B. THE SYNTAX OF CONCESSIVES

The fundamental syntactic fact about concessive constructions is that they impose a rather specific restriction on the NPs that may appear in the main clause of any sentence containing a concessive. This restriction is explainable by appeal to the particular semantic function of concessives, which is discussed at length in the next section of this chapter. Briefly, however, the restriction is that the identity of the person or thing described by the concessive clause must be unknown to speaker, hearer, or both, and so cannot be revealed by the main clause. This constraint is subject to fairly well-defined dialectal variation, and will be more carefully described later.

Consider first sentences like the following, in which whoever appears as the head noun in subject complements.

(15) Whoever says so is a liar. (=6)

(16) Whoever robbed the bank should be punished.

(17) Whoever comes will be welcome.

(18) Whoever murdered George lives in that house.

(19) Whoever wrote that book is the man we want.

Now note that (20) and (21) are completely ungrammatical.

(20) *Whoever robbed the bank is John.

(21) *Whoever wrote that book is the man who lives in that house.

(15)-(19) freely permit negation of the main predicate, as in (22).

(22) Whoever robbed the bank should not be punished.

(20) and (21) with negation of the main clause are, if not completely acceptable, at least better than they are without the negation.

(23) ?Whoever robbed the bank isn't John.

(24) ?Whoever wrote that book isn't the man who lives in that house.

The types of relative clauses which can appear with concessive complements are similarly restricted.

(25) *Whoever robbed the bank, Ma Barker, should be punished.

(26) *We will buy whatever is cheapest, a Volkswagen.

(27) *I will give the prize to whoever finishes first, the brightest student.

(28), (29), and (30), however, are grammatical.

(28) Whoever robbed the bank, probably Ma Barker, should be punished.

(29) We will buy whatever is cheapest, undoubtedly a Volkswagen.

(30) I will give the prize to whoever finishes first, very likely the brightest student.

Qualifiers like probably are sufficient to indicate that the speaker is not certain of the identity of the referent of the concessive, and so the restriction as it applies to appositives is removed. This restriction will be somewhat expanded on below, but an exhaustive statement of it must await more extensive research on the properties of qualifiers like probably and undoubtedly.

Similar comments can be made about concessives used as sentence adverbials. Some additional examples follow.

(31) I still don't believe it, whoever told you.

(32) Whoever robbed the bank, the police have a big job ahead of them.

(33) Whoever comes, we're going to have a good time.

(34) Whoever murdered George, there's no sense in our worrying about it.

(35) Whoever wrote that book, the whole matter is no concern of ours.

Predictably, (36) and (38) are grammatical, but (37) and (39) are not.

(36) Whoever robbed the bank, John didn't do it.

(37) *Whoever robbed the bank, John did it.

(38) Whoever wrote that book, we know it wasn't Nathanael West.

(39) *Whoever wrote that book, we know it was Nathanael West.

Concessive complements obviously bear a surface resemblance to embedded questions, but it is plain that they are not embedded questions. For example, (40) and (41) are clearly ungrammatical.

(40) *I know whoever won the election.

(41) *John told me whatever he bought at the store.

The concessive adverbials in, for example, (31)-(35) can be paraphrased by any of several synonymous constructions like "It makes no difference..." or "No matter...." For example,

(42) I still don't believe it, no matter who told you.

(43) No matter who robbed the bank, the police still have a big job ahead of them.

To a large extent, the properties of concessives and their paraphrases like those mentioned are alike. For example, compare (44) and (45) with (46) and (47). All are ungrammatical.

(44) *No matter who robbed the bank, it was John.

(45) *No matter who wrote that book, it's the man who lives in that house.

(46) *Whoever robbed the bank, it was John.

(47) *Whoever wrote that book, it's the man who lives in that house.

Now observe that (48) and (49) are grammatical.

(48) No matter who you think robbed the bank, it was John.

(49) Whoever you think robbed the bank, it was John.

It is, as implied above, a sufficient condition for the use of concessive clauses or their paraphrases that the hearer be unaware of the identity of the NP described by the clause. In (48) and (49), the speaker must presuppose that his hearer is mistaken in any idea he has as to the identity of the robber, and so is in fact unaware of the robber's identity.

With a negative main clause (46) and (47) are grammatical

(50) Whoever robbed the bank, it wasn't John.

(51) Whoever wrote that book, it's not the man who lives in that house.

However, for my speech at least, this is not true of sentences like (44).

(52) *No matter who robbed the bank, it wasn't John.

I have at this point no explanation for this syntactic difference between concessives and the apparently synonymous constructions of the "no matter..." type.

Another syntactic difference between these constructions (in some dialects) is that the former in some circumstances allow deletion of the copula, while the latter do not.

(53) {Whatever the reason is / No matter what the reason is} ...

(54) {Whatever the reason / *No matter what the reason} ...

These examples provide an idea of the relevant syntactic characteristics of concessive constructions. The next section of this chapter attempts to correlate these facts with the semantics of concessives.

C. THE SEMANTICS OF CONCESSIVES

I have already quoted Jespersen as saying that concessive constructions, in many cases at least, connote "genericness" or "indifference to choice." This is illustrated by sentences like (6) and (9). Now notice that we have sets like the following:

(55) Anyone who robbed a bank should be punished.

(56) Everyone who robbed a bank should be punished.

(57) Whoever robbed a bank should be punished.

(55), (56), and (57) are obviously very close to each other in meaning, and perhaps are all "generic", on a broad definition of that term. But they are not in fact completely synonymous, and cannot be on syntactic or semantic grounds considered to be merely surface variants.

Consider first (55) and (56). There is a crucial presuppositional difference between these two sentences. (55) does not presuppose that someone did in fact rob a bank, but (56) does. Thus (58) is not internally contradictory, although (59) is.

(58) Anyone who robbed a bank should be punished, but no one robbed a bank.

(59) *Everyone who robbed a bank should be punished, but no one robbed a bank.

(57) is like (56) in this respect, i.e., (57) also presupposes the existence of a bank robber. But of the following pair of sentences, only the first is grammatical.

(60) Everyone who robbed a bank, namely Joe, Bill and Tom, should be punished.

(61) *Whoever robbed a bank, namely Joe, Bill and Tom, should be punished.

Thus we can see that concessives differ from anyone with respect to the presuppositions involved, and from everyone with respect to the possibility of co-occurrence with appositives. These facts, and many others, are, I think, explained by an appeal to the semantic properties of concessives. As I said above, there is dialect variation here, but its general features appear to be fairly earily describable.

The crucial fact is that while concessives do, as pointed out above, presuppose the existence of a referent, they also presuppose that the identity of the referent is not known, either to both speaker and hearer or to just one of them, depending on the dialect. In both dialects, however, the speaker may indicate that he believes his hearer thinks he knows the identity of the referent, but is mistaken. Sentence (50) illustrates this situation. This "concealment" of tne identity of a referent is one of the basic characteristics of concessives, and, as the examples just given indicate, it requires that they be distinguished from other constructions which are at first glance quite similar. Since my own dialect is the former of the two described, i.e., that in which the identity of the referent must be unknown to both speaker and hearer, I will for the most part limit myself to a description of this dialect in what follows.[1]

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[1]Labov (1970) has pointed out that such a use of the term "dialect" is quite odd and misleading, but I know of no better term, and no one has made any proposals. I have no idea what might account for such a "dialect" difference. In general, however, it has recently become clear that variations of this sort must be dealt with, and they have attracted the attention of a number of linguists. See for example Bolinger (1968), Carden (1970), Elliott, Legum and Thompson (1969), Heringer (1970), Labov (1969, 1970), and Postal (1968).

Notice now that example (16) is essentially paraphrased by (62).

(16) Whoever robbed the bank should be punished.

(62) The person who robbed the bank should be punished.

But (62) is ambiguous, and (16) paraphrases it on only one reading. (62) is also appropriate to a situation in which the speaker knows who robbed the bank, and thus (63) is grammatical.

(63) The person who robbed the bank, Ma Barker, should be punished.

Notice also the following pairs:

(64) The man who robbed the bank, whom I just arrested, should be punished.

(65) *Whoever robbed the bank, whom I just arrested, should be punished.

(66) The man who robbed the bank drove a blue car. He told me so himself.

(67) *Whoever robbed the bank drove a blue car. He told me so himself.[2]

---

[2]In (67), of course, the asterisk is meant to indicate that the discourse, not its component sentences, is ill-formed.

At this point, our interests coincide to some extent with those of a recent philosophical discussion of an aspect of the problem of reference, and we are able perhaps to offer a clarification of this discussion. Donnellan (1966) draws a distinction between what he calls the "referential" and "attributive" uses of certain nominal constructions, of which "the person who robbed the bank" is a typical example.

According to Donnellan, when a speaker uses a noun phrase referentially, he intends for his listener to be able to pick out some person, object, etc., which is the referent of that noun phrase. It does not matter, on this account, whether or not the referent actually fits the description used. To take an example of Donnellan's, if I ask, "Is the man carrying the walking stick the professor of

history?" it may turn out that the man was in fact carrying an umbrella, or even that what I took to be a man with a walking stick was actually a rock. Nevertheless, I have used the noun phrase "the man carrying the walking stick" referentially, since I intended that my hearer be able to pick out something referred to by that expression.

On the other hand, when a speaker uses a noun phrase attributively, he does not intend that his hearer be able to pick out or find a referent for the NP, but here, for reasons which Donnellan goes into detail, it is crucially important that the referent of the NP fit the description given.

One of Donnellan's key examples is the sentence "Smith's murderer is insane." We can use the phrase "Smith's murderer" to refer to some particular person, who may not in fact have murdered Smith (the referential use), or we may use the same phrase if we decide, having "come upon poor Smith foully murdered," that there must have been a murderer (the attributive use). When using such an expression in the attributive sense, Donnellan says, "in a quite ordinary sense we do not know who murdered Smith (though this is not in the end essential to the case)" (p. 285; my emphasis).

Donnellan cites no examples involving "whoever" or similar forms. I believe that objections can be made to Donnellan's claims based on the examples he uses, but that is probably not relevant here. It is my contention, however, that for the class of constructions I am considering here, it is quite essential that "we do not know" this or that, and that this is exactly the semantic force of these constructions.

It should be pointed out that there are also noun phrases which are not ambiguous as to the referential-attributive distinction. For

example, the NP "the man who is sitting in that chair," it would seem, has only the referential use. As far as I know, no one has as yet given any general characterization of noun-phrases which can and cannot be used both referentially and attributively. It is not even clear whether such a characterization can be given in any systematic way.

This qualification aside, we may say that a sentence like (16) may be paraphrased by a sentence like (62) only on the attributive interpretation of the subject NP in (62). It may be inferred from the immediately preceding paragraph that all a syntactician can do with these facts is to mark them in an ad hoc way by using "features" like [+referential] and [-referential]. It is plain enough, however, that one reason why a speaker might use a sentence like (62) attributively is that although he may know that there exists a "man who robbed the bank," he might not know who that man is, and therefore could not use the expression to refer to any particular person.

It might be objected that the class of non-referential noun-phrases and the class of noun-phrases which imply that the speaker "does not know" something simply coincide. The main reason why I think this is not so, for my own speech at least, is given above. There are, however, some other observations that can be made to indicate that this is not the case.

Heringer (1969) gives the following sentences as containing examples of attributive noun phrases.

(68) John wanted to catch a fish.

(69) Henry tried to locate a winged horse.

(70) Max is a doctor.

(71) I didn't find an osteopath.

(72) Did you hit a pig in the snout?

Now, although the underlined noun phrases in (68)-(72) are interpreted attributively, these sentences are in no way taken to mean that someone "does not know" this or that. In fact, if we bring in this notion, as in (68a) and (69a), the underlined noun phrases are now interpreted as specific, and hence referential.

(68a) John wanted to catch a fish, but I don't know which fish.

(69a) Henry tried to locate a winged horse, but I don't know which winged horse.

Similar continuations of (70) and (71) produce unacceptable sentences.

(70a) *Max is a doctor, but I don't know which doctor.

(71a) *I didn't find an osteopath, but I don't know which osteopath.[3]

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[3]For extensive discussion of sentences of this kind, see Karttunen (1969).

Thus, in these examples at least, the provinces of the two notions we are considering do not appear to be the same.

Following is a summary of the arguments so far:

I. Concessive constructions are not synonymous with the general quantifiers any and every because:

a. concessives are unlike any in that they presuppose the existence of a referent and

b. concessives are unlike every in that they presuppose that the identity of the referent is unknown to (at least) the speaker.

II. Point b. in I offers an explanation for the fact that concessives cannot cooccur with referential nominals.

III. Concessives cannot be considered to be "attributive" NPs in precisely the sense of Donnellan (1966) also because of point b. in I.

I said above that (55), (56), and (57) are all, on a broad definition of the term, "generic" sentences. However, a sentence like (73) is in some sense ambiguous.

(73) He gave a present to whoever came through the door.

This sentence can be paraphrased in two distinct ways:

(74) He gave a present to everyone who came through the door.

(75) He gave a present to whoever it was that came through the door.

It is not necessary, however, to say that in cases like this there are two separate and distinct uses of concessives: the "generic" use and the "lack of knowledge" use. On <u>both</u> interpretations of (73), it is implied that the speaker does not know the identity of "whoever came through the door." The difference between the two interpretations of (73) lies in the fact that the concessive can be interpreted either specifically or non-specifically, and <u>it</u>- (and <u>there</u>-) insertion are applicable only to specifics.

The preceding discussion gives some idea of the general semantic properties of concessive constructions, and provides, I think, motivation for a more detailed study of these properties as part of the general investigation of the important philosophical problem of

reference. Coupled with these properties is the emotive aspect of concessive constructions. They are paraphrasable by any of the several members of a specific subclass of emotive predicates, such as irrelevant, unimportant, it makes no difference, no matter, etc. (42) and (43) were given above as examples of this. Notice also (76).

(76) It's irrelevant (unimportant) who robbed the bank;
the police still have a big job ahead of them.

Concessive adverbials appear always to carry this semantic interpretation. Concessive subject and object complements are susceptible to it. This appears to be, although I can speak only intuitively, just the effect of adding extra stress to -ever. The important fact is that the corresponding attributive NPs cannot be stressed to produce the same effect. At present, I am not certain as to what the implications of this fact might be, nor am I able to offer any convincing proposals for representing these facts within any currently available formulation of the general theory of transformational grammar.

It is clear that the adverbial function of concessives must be kept distinct from their function as subject and object complements, since both constructions can appear in the same sentence.

(77) The man who robbed the bank, whoever he was, will be caught soon.

(78) Whoever robbed the bank, whoever he was, will be caught soon.

(79) The man who robbed the bank will be caught soon.

(80) Whoever robbed the bank will be caught soon.

It is my impression that (80) can be read with neutral intonation, in which case it is completely synonymous with (79), or with stress on

-ever, in which case it is not. In (78), on the other hand, stress on the whoever of the main clause is not possible. If this is true, it indicates that (80) with stress on whoever is related to (78) in a way that (80) without stress on whoever is not. Rather, (80) without stress on whoever is related directly to (79).

We appear to be faced here, not with a problem involving the behavior of a particular class of words, but with another syntactic construction one of whose major functions is the bearing of an emotive predication. But in some cases, the emotive interpretation appears to depend crucially on stress, and it is not clear what the correlates of this stress change may be in the semantic or syntactic representations of the sentences involved, any more than it is clear what the correlates of any other type of emphatic or contrastive stress may be. The discussion here, although far from complete, provides the motivation and the groundwork for a more extensive investigation of the many interrelated topics that have been touched upon.

D. SOME SPECULATIONS ON THE SYNTACTIC ANALYSIS OF CONCESSIVES

I have said that concessive subject and object complements can be paraphrased by attributive noun phrases. This fact provides an extra piece of syntactic evidence for the distinction proposed by Donnellan (1966) between referential and attributive NPs. It seems natural to propose that concessives are derived from attributive NPs. The details of the syntactic description remain to be worked out, but some observations can be made.

It is obvious that concessives must themselves have the syntactic form of full sentences, but attributive noun phrases need not.

(81) The murderer is insane.

"The murderer" in (81) can be interpreted either referentially or attributively. But the only concessive construction corresponding to the attributive reading of (81) is (82).

(82) Whoever is the murderer is insane.

This fact appears to fit in very nicely with Bach's (1968) proposal that the more basic form of a sentence like (81) is something like (83).

(83) The one who is the murderer is insane.

That is to say, the rule of concessive formation can apply to the structure underlying (82) or the appropriate deletion rule can apply to the same structure, producing (81). In this way, the synonymy of the three sentences can be brought out clearly.

Bach's proposal is essentially equivalent to saying that all nouns are introduced into sentences by way of relative clauses. Such a derivation as that proposed would also bring out the relationship of concessives to relative clauses, which, as I have said, has been noticed by traditional grammarians.

The syntactic analysis of concessive adverbials presents some problems which go beyond these constructions themselves, and which up to this time have received little attention. The syntax of the formation of complex sentences in English, and especially the syntax and semantics of particular complement structures, has received a great deal of attention from generative grammarians. The most widely accepted view, at the present time, is that there are two basic principles of complex sentence formation: <u>conjoining</u> and <u>embedding</u>. It is fairly easy to give a definition of an embedded sentence. Such a sentence is one that bears one of the basic grammatical relations, such as subject or

object, to another sentence.[4] A definition of conjoining is not so

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[4]This of course excludes relative clauses. Thompson (1969) gives arguments why relative clauses should be derived from conjunctions, and also gives a much more extensive characterization of embedding.

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easy to come by, but this is usually taken to include sentences joined by and, but, or and perhaps a few other "coordinate conjunctions." There remains the very ill-defined notion of "subordinate clause." A number of studies have commented on various aspects of the syntax of such clauses, but there has been little general discussion. Thompson (forthcoming) notes the arguments in Geis (1969) that several constructions that were previously considered to be subordinate clauses can be shown to be underlying relative clauses or noun complements. She then proposes, on the basis of several pieces of syntactic evidence, that we must recognize a new type of complex sentence formation, which she calls "subjoining."

According to Thompson (personal communication), the evidence she has collected so far would not allow us to include concessive adverbials in the class of subjoined clauses. She points out, for example, that subjoined clauses are typically introduced by various "subordinate conjunctions," and are subject to several general grammatical processes, such as deletion and gerund formation. This is not true of concessives. And, as she remarks, there are a number of other constructions whose analysis is at present quite unclear, such as the underlined clause in (84).

(84) Ernestine never became Miss America, her famous beauty notwithstanding.

A number of other such problematic examples are discussed in the appendix to Rutherford (1970).

It is clear that concessive adverbials will have to be derived from sentences, that is, in a loose sense, they are "complement sentences" of some sort. Their specific semantic function has been described above. What is needed is some motivated way of representing the syntactic relationship of the concessive to the main clause, so that this syntactic relationship, whatever it may be, can be shown to be a specific instance of a general grammatical phenomenon.

CHAPTER FIVE

CONCLUSION

As I stated in the Introduction, the fundamental purpose of this study has been to establish the claim that an adequate grammar of English must recognize the fact that there are a number of syntactic constructions which express only emotive or exclamatory predications, and that these constructions can be distinguished by syntactic criteria from other superficially similar constructions.

It is evident that a study such as this provides a number of facts which must be taken into account by anyone interested in constructing a theory of sentence types. I alluded briefly in Chapter I to the fact that many such theories have been offered by traditional grammarians. Although Postal, in his critique of taxonomic syntax (1964, p. 74), listed as one criticism the fact that "the notion of sentence type is not reconstructed," only recently have transformational linguists, such as Ross (1970) and Sadock (1968, 1970), made any progress toward a theory of universal sentence types.

As mentioned in Chapter I, at least four basic sentence types have been widely recognized: declaratives, imperatives, questions and exclamations. One thing that emerges quite clearly from this study is that there are at least morphological similarities linking the last two types in unique ways. In Chapter I, I devoted some

effort to showing that embedded exclamations and embedded questions are syntactically distinct. This of course would not have been necessary were it not for the fact that in many cases the two constructions are on the surface quite identical.

The similarities do not end here. Another point is to be made with respect to the rule of noun-phrase extraposition discussed in Chapter II. It happens that at least some of the sentences analyzed in that chapter have paraphrases with what appear to be embedded exclamations. Compare the following examples to sentences (5)-(8) in Chapter II.

(1) It's awful what a price you have to pay for tomatoes in the winter.

(2) ?It's a disgrace what a way he behaves in when he's drunk.

(3) It's a disgrace how he behaves when he's drunk.

(4) It's marvelous what an amount of weight I've lost since I started on that diet.

(5) It never ceases to amaze me what size dress my neighbor wears.

Again, this construction is not permitted with non-exclamatory predicates.

(6) *It's high what a price you have to pay for tomatoes in the winter.

Extraposition is obligatory in all of these except (3).

(7) *What a price you have to pay for tomatoes in the winter is awful.

(8) *What a way he behaves in when he's drunk is a disgrace.

(9) How he behaves when he's drunk is a disgrace.

(10) *What size dress my neighbor wears never ceases to amaze me.

It is here that we can demonstrate an interesting analogue to a situation described in a recent paper by LeRoy Baker (1969). He discussed what he calls "concealed questions," giving the following examples:

(11) I'm not sure I know the one you mean.

(12) See if you can find out the person or persons that committed that atrocity.

(13) Tell me the house you wish that package delivered to. (p. 2)

Baker refers to sentences like (11)-(13) as "concealed questions" because they are understood interrogatively, and because they have paraphrases with embedded questions containing WH-words.

(14) I'm not sure I know which one you mean.

(15) See if you can find out which person or persons committed that atrocity.

(16) Tell me which house you wish that package delivered to.

The major claim in Baker's paper is that concealed questions cannot be derived from embedded questions, and, conversely, that embedded questions cannot be derived from concealed questions. The evidence for this claim is that there are embedded questions without

corresponding concealed questions, and that derivation in the opposite order appears to require ad hoc restrictions.

Baker proposes instead that there is in fact no syntactic relation at all between embedded questions and concealed questions, but only the obvious semantic one. He does not state precisely the conclusions for linguistic theory that he draws from this, but does say that the "level at which these constructions [embedded and concealed questions] are defined... is not that of semantic representation" (p. 10).

What is particularly relevant to this study is Baker's observation that his concealed questions appear to have the surface form of relative clauses. He in fact maintains that they are syntactically relative clauses, and claims therefore that this renders untenable the argument that relative clauses are derived from conjunctions (see Thompson 1971) since concealed questions have no conjunction paraphrases.

(17) The police figured out the man who committed the murder.

(18) *A man committed the murder and the police figured out the man.

Whether or not one accepts Baker's arguments against deriving concealed questions from embedded questions, it is clear that although Chapter I had as its aim the analysis of a class of non-interrogative English sentences, it seems to have uncovered a situation very much like that found by Baker. As a comparison of sentences (1)-(5) above and sentences (5)-(8) in Chapter II will show, we have another group of synonymous sentences, one of which

nas a WH- construction, the other of which has a relative clause.

So far, I have made the following observations:

A. Both questions and exclamations make use of WH- forms.

B. Despite demonstrable syntactic differences, questions and exclamations have identical surface forms in many cases.

C. Embedded questions and embedded exclamations both show paraphrases with relative clauses.

There is at least one other point to be noted, one which depends largely on intuition. In general, any yes-no question in English can be used not only as a "real" question, asking for information, but also as an exclamaton. Consider (19) as an example:

(19) Does she have beautiful legs $\{^{?}_{!}\}$

As an exclamation, such a sentence would typically be pronounced with a falling intonation, not a rising one, as is true of yes-no questions. A demonstration of this ambiguity is the existence of sentences like (20).

(20) Boy, does she have beautiful legs!

Here, the use of "interjections" like Boy, Wow, My God, Man, etc., is limited to exclamations, and is not possible with questions. That is (20) with rising question intonation is distinctly ill-formed.

These facts take on additonal interest when we observe that similar statements can be made about a number of languages besides English.

FRENCH

(21) Quelles belles maisons il a acheté!
what pretty houses he bought!

(22) Quelles maisons a-t-il acheté?
What houses did he buy?[1]

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[1]Also of interest here is the French "Que S" construction, exemplified by (i), which is also interpreted exclamatorily.

(i) Que je suis content!
That I am happy = How happy I am!

But this construction cannot be used with just any sentence expressing a proposition which can be "exclaimed" about.

(ii) *Que ce livre coûte 200 dollars!
That this book costs 200 dollars

I have not yet been able to look into this very far, but my guess is, and my informants suspect that I am right, that this construction is limited to sentences with "scaled predicates" like those mentioned in note 11 to Chapter I.

RUMANIAN

(23) Ce om plăcut este!
What man nice is = What a nice man he is!

(24) Ce fel de om este?
What kind of man is = What kind of man is he?

(25) Cât de plăcut este {?!}

Ambiguously, depending on intonation, "How nice is he?" or "How nice he is!"

GERMAN

(26) Wie angenehm ist es!
How nice it is!

(27) Wie tust du das?
How do you do that?

(28) Was für ein schöne Tag ist es!
What a nice day it is!

(29) Was hast du gelesen?
What have you read?

CHINESE (Mandarin)

(30) Ta duoma gao {?!}
He how tall = "How tall is he?" or "How tall he is!"

RUSSIAN

(31) Kak ona kras'ivaya!
How she beautiful = How beautiful she is!

(32) Kakaya kras'ivaya devochka!
What beautiful girl = What a beautiful girl!

(33) Kakaya devochka te vidal?
What girl you saw = What girl did you see?

(34) Kak vy zhiv'ot'e?
How you live = How are you?

JAPANESE (Literary)

(35) Nan to yuu uso o tsuku no deshoo!
What lies he tells!

(36) Nan no uso o tsukimashitaka?
What lies does he tell?[2]

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[2]My informant tells me that this correlation also exists in colloquial Japanese. Although he does not know the historical details, he suspects that these constructions were borrowed from Chinese.

TURKISH

(37) Ne lezzetli yemek yapiyon!
What delicious meals she is cooking!

(38) Ne yemek yapti aksam için?
What meal did she cook dinner for?

I am at present making a necessarily random inquiry to see just how widespread this phenomenon is. But in just these examples, it appears in six separate linguistic families or subfamilies.

Other similarities between interrogatives and relatives in English have of course been remarked on many times. Kuroda (1968) attempted to account for their morphological similarities, but "(left) open the problem of whether the WH- interrogative and WH- relative words are related not just formally but even substantially or semantically." No one would deny, however, that an answer to the

question neglected by Kuroda would be even more satisfying and significant than an account based purely on morphological similarities.

At the present time, I have only a vague speculation or two as to why questions and exclamations should share so many characteristics, despite their demonstrable syntactic and semantic distinctness, or as to why at least some languages have distinctly "exclamatory" constructions.

In any event, we may have here another route to this study of "substantive semantic universals" in the sense of Chomsky (1965), and one which is interestingly restricted. It is not surprising that all languages should have words referring to persons, or ways of denying propositions, but it is conceivable that they might be able to get along without syntactically definable exclamatory constructions. Of course, given only the spotty evidence I have been able to accumulate so far, it is not even clear how many languages do in fact have such constructions. But the evidence given for English, and the remarkable similarities across even a few languages, should be sufficient to convince us that we have here an area of syntax that is distinct and that must be accounted for in any theory of language.

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Linguistics as Chemistry:

The Substance Theory of Semantic Primes

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Linguistics as Chemistry:
The Substance Theory of Semantic Primes*

Arnold M. Zwicky

0. Introduction. The aims of this paper are (a) to place theoretical principles in linguistics in a larger conceptual framework, especially to note similarities between linguistics and various natural sciences (not only chemistry, but also physics and biology), and (b) to draw out a parallel between a particular organizing hypothesis in semantics (the Substance Theory) and assumptions of the classical theory of chemical elements, to the end of arguing that this parallel is one of structure and that the chemical case can suggest interesting lines of inquiry in the semantic case. I should emphasize at the outset that I am not asserting any overall parallel, structural or otherwise, between linguistics and chemistry. In the principal sections of this paper, I am concerned with only one area of chemistry, the theory of substances and elements, and only one area of linguistics, the theory of words and semantic primes.

1. Types of Principles in Linguistics. Before a treatment of elements, chemical and linguistic, it is necessary to distinguish a number of different types of "theoretical principles" in linguistics. My intent here is first to separate methodological principles from systematic principles, the latter being my real concern, and then to categorize systematic principles by level, from "descriptive" or "observational" statements to organizing hypotheses, central assumptions which, while capable of empirical test, tend to define an area of investigation.

1.1. Methodological Principles. Methodological principles, or "rules of thumb", are not assumptions capable of verification or falsification in any ordinary sense. Instead, their function is to suggest what the most likely state of affairs is in a given situation, in the absence of evidence of the usual sort. This being the case, the indication given by a methodological principle is always outweighed by any other evidence. As a consequence, methodological principles can be stated in an extreme form. A few linguistic examples will perhaps make these points clearer.

First, the Majority Vote Principle in comparative reconstruction--the guideline that says that if the majority of daughter languages agree in having a certain feature, then that feature is to be attributed to the protolanguage. Certainly, no one involved in reconstruction believes this to be valid in general; but when there is no special evidence on the point, the majority will carry

the day. If there are other facts that bear on the point, they will prevail, of course.

Second, the Contrast Principle in phonology, which says that if segments are in contrast, then they are underlyingly distinct. In the context of structuralist linguistics, the Contrast Principle is an organizing hypothesis rather than a methodological one (see section 1.2.2 below), but within the framework of generative phonology, it acts as a methodological principle, in the sense that if there is no contravening evidence, surface contrasts are also underlying contrasts.

Third, the Surfacist Principle in syntax, an analogue of the Contrast Principle. This is the rule that, ceteribus paribus, the syntactic structure of a sentence is its surface constituent structure. Or, that if you claim that some sentence has a remote syntactic representation, that is, one different from its bracketing into labeled constituents, you have to prove it.

These examples are familiar enough not to require an extended justification of the principles involved. In each case, the methodological principle provides a kind of background assumption, a position taken when no other is especially supported.

Instead of being verified or falsified, methodological principles are judged as useless or useful, according as the descriptions they recommend are confirmed or not. To support a methodological principle, you provide numerous illustrations of cases where it chose a description that turned out to be well supported on other evidence. To refute a methodological principle, you adduce cases where the principle selects a description that turns out to be unsatisfactory for independent reasons. In either direction, such arguments are not easy; for the beginning of a negative argument, see Zwicky (1970b) concerning the Free Ride Principle, a methodological principle opting for longer derivations over shorter ones, other things being equal.

Examples of methodological principles from other sciences are not hard to find. In this category are the widespread preferences for round numbers, for equations of degree n over those of degree n+1, and for circles over other conic sections, among many other preferences for "simple" accounts.

1.2. Systematic Principles. In contrast to methodological principles, which are apt to be termed "rules" (in one sense) or "guidelines", systematic principles are "descriptions", "observations", "regularities", "rules" (in another sense), "laws", "assumptions" or "hypotheses", depending upon their extent and abstractness. I assume here that the differences are in degree, especially in view of the observations of many philosophers (e.g. Hanson, Kuhn, and Toulmin) that "theoretical" assumptions infect observation in significant ways. That is, I assume that there is a cline from (a) through (e) below (and beyond):

(a) observations that someone said a particular thing on some occasion, or made a particular judgment about an utterance on some occasion;

(b) observations that the members of some speech community usually make the same judgment on some point;

(c) claims about the existence of a particular rule (say, NEG-Transportation) in English:

(d) hypotheses about constraints limiting the applicability of rules in a particular language, or universally;

(e) hypotheses about the range of possible rules in natural languages.

My concern in the following sections is with the more "theoretical" (like (d) and (e)) statements than with the more "descriptive (like (a) and (b)) statements. But even these "theoretical" assertions range from relatively low-level assumptions, typically capable of precise formulation and usually subject to tests of some standard kind, to much more abstract propositions, often stated rather vaguely and not amenable to straightforward tests and argumentation. The more abstract propositions tend to act as organizing principles defining a field of investigation. Although the deeper principles are in some sense open to empirical verification or falsification, the tests required are quite indirect, or involve extremely complex chains of inference in which various fundamental assumptions function. Without intending to claim that the deeper principles are untestable, I have termed the lower-level statements arguable propositions and the more abstract ones organizing hypothesis.

1.2.1. Arguable Propositions. Any "natural law" would serve as an example of an arguable proposition. Let us take an example from physics, Newton's Inverse Square Law, which states that the gravitational force between two bodies is inversely proportional to the square of the distance between them;

$$F = \frac{k}{R^2}$$

(where R is the distance between the two bodies and k is a constant associated with the two bodies). How do we tell that this is an inverse square law, rather than, say, an inverse cube law? A methodological principle chooses squares over cubes so long as the observations on the matter are reasonably consistent with this assumption. Aside from this, the two positions are indistinguishable so long as (a) the range of evidence is narrow, and (b) the accuracy of the measuring device is low, and (c) outside effects cannot be discounted. If we have measurements only over a narrow range for R, then we may not be able to distinguish the squares hypothesis from the cubes hypothesis, given the accuracy of our measuring devices and the fact that small perturbations may be random, due to experimenter's error, or a result of outside effects not calculated for. Similarly, very accurate measurements may be worthless if they cannot be made over a sufficient range of values.

The garden-variety arguable propositions of current linguistics are universal hypotheses, most of them exclusions, restrictions on

the use of certain notational conventions. A typical example is "There are no curly brackets in syntax", a claim intended to illegitimize references to

$$\text{TNS} \quad (\quad \left\{ \begin{matrix} \text{M} \\ \text{have} \\ \text{be} \end{matrix} \right\} \quad)$$

and the like in syntactic rules. This particular use of the device is criticized first by Ross (1969a); it is treated from a broader perspective by Zwicky (1968) and assimilated to the general exclusion principle by McCawley (1970a). To be effective, the exclusion hypothesis must be supported by observations over the appropriate range, and these must be suitably accurate and there must be some assurance that outside effects are not interfering significantly with the evidence. That is, there must be arguments that different phenomena, in different languages, which might have been thought to require the use of curly brackets, do not in fact do so, and there must be arguments supporting the general adequacy and completeness of the grammars referred to (for if features of the rules in question were dependent on small changes in other rules, the evidence from these descriptions would not be worth much), and there must be reason to believe that the supporting evidence is not seriously affected by external factors (difficulty in understanding sentences, for example).

Arguable propositions, like Newton's Inverse Square Law or the No Curly Brackets Proposal, may also be defended or attacked through arguments of a deeper sort, referring to general principles of scientific explanation (falsifiability, simplicity, plausibility, for example). Thus, the naturalness argument described in Zwicky (1968) in favor of the No Curly Bracket Proposal is an appeal to theoretical simplicity, of the same type as the argument for the Copernican heliocentric theory against the geocentric theory on the basis of the elegance of the former as opposed to the complexity of the latter's epicycles.

Other examples from linguistics: a proposal by Chomsky that no transformational rule insert material from one S into a lower S; an unpublished, but much discussed, suggestion of Kiparsky's that rules effecting absolute neutralizations in phonology be prohibited; the hypothesis that syntactic rules cannot be conditioned by phonological features (the Principle of Phonology-Free Syntax, treated in Zwicky (1969)); the assumptions that all the information required for the conditioning of phonological rules is available in superficial syntactic structure (the Principle of Superficial Constraints in Phonology, mentioned in Zwicky (1970a)); a proposal in Zwicky (1970c) for limitations on the use of Greek-letter variables in phonological rules; and a hypothesis, put forward tentatively by Chomsky and Halle (1968) that the phonological cycle be restricted to prosodic phenomena.

The cases that come first to mind are all exclusive principles, thanks to the emphasis within transformational-generative grammar on restricting the range of notational conventions and their

possible uses, as a way of specifying as narrowly as possible the notion "possible natural language". Arguable propositions in the natural sciences are customarily stated positively, but they can easily be converted into exclusive principles; Newton's Inverse Square Law, for example, can be interpreted as a ban on physical systems in which the gravitational attraction between bodies is any function of R besides $1/R^2$. The difference then between the linguistic examples and the physical example is simply one of degree; physical principles are typically much more specific in their exclusions than linguistic hypotheses.

There are, however, many sorts of specific, positively stated arguable propositions in linguistics. Putative linguistic universals, such as those treated by various authors in Greenberg (1963), are cases. So are claims that particular rules, phonological or syntactic, are universal in character; such propositions have been arguable by Bach (ms. 1970), Foley (ms. 1970) and Stampe.

1.2.2. Organizing Hypotheses. Organizing hypotheses are high-level assumptions, fundamental empirical hypotheses. Various principles of linguistic change have this character--the Neogrammarian hypothesis of the regularity of sound change and Kiparsky's (1968) proposal that rules reorder in time so as to reduce markedness, for instance. Also of this character are assumptions about the directionality of the relationship between syntactic and semantic representations. The most salient fact about such assumptions is that they are not easily given up, even in the face of apparent counterexamples, which will be treated as manifestations of minor complicating principles or as outright anomalies (cf. Kuhn (1962)). It is this resistance to disproof that gives organizing hypotheses their "field-defining" nature. They are testable, in some sense, and they can be abandoned after argument, but the tests are not simple, nor the arguments straightforward.

As emphasized earlier, there is no sharp break between arguable propositions and organizing hypotheses. The Principle of Phonology-Free Syntax and the Principle of Superficial Constraints in Phonology, mentioned in the preceding section, are fairly high-level assumptions and might be taken to be organizing hypotheses; I have listed them as arguable propositions because that is the way they are viewed in the articles cited, but it would be possible to consider them more fundamental--as together asserting a basic "separation of levels" between syntax and phonology.

Before returning to linguistic matters, I give, for comparison, two celebrated cases of organizing hypotheses in the physical sciences. First, the Newtonian (originally, Galilean) inertial principle of motion versus the Aristotelian, or resistance, conception. Toulmin (1963, 50-1) observes that

> Aristotle concentrated his attention on the motion of bodies against appreciable resistance, and on the length of time required for a complete change of position from one place to another. For a variety of reasons, he never really tackled the problem of

> defining 'velocity' in the case when one considers progressively shorter and shorter periods of time--i.e. instantaneous velocity. Nor was he prepared to pay serious attention to the question how bodies would move if all resisting agencies were effectively or completely removed. As things turned out, his hesitations were unfortunate; yet his reasons for hesitating are understandable, and in their way laudable...Leaving aside free fall for the moment as a special case, all the motions we observe going on close around us happen as they do (he saw) through a more-or-less complete balance between two sets of forces; those tending to maintain the motion and those tending to resist it. In real life, too, a body always takes a definite time to go a definite distance. So the question of instantaneous velocity would have struck him as over-abstract; and he felt the same way about the idea of a completely unresisted motion, which he dismissed as unreal.

Here we have a sympathetic exposition of an organizing hypothesis formulated by Aristotle. In Aristotle's common-sensical view, bodies move only while they are impelled. A wagon on a country road, not a freely falling ball, is the paradigm for dynamics. The position is, ultimately, empirical. However, it is easier to imagine tests of Newton's Inverse Square Law (given that there is some attractive force between bodies) than to construct experiments bearing on the Aristotelian Resistance Hypothesis. In time, this hypothesis was abandoned in favor of a different organizing hypothesis, Newton's First Law (that every particle continues in a state of rest, or in motion with constant speed in a straight line, unless acted upon by an outside force). Both hypotheses are difficult to formulate precisely, and the change from one to the other was accompanied by changes in other fundamental assumptions and was supported by arguments of many different types (experimental evidence bearing indirectly upon the question, plus general consideration of adequacy in explanations).

A second examples comes from astronomy. This is Kepler's First Law, that the orbit of each planet about the sun is elliptical, with the sun at one of the foci of the ellipse. This organizing hypothesis replaced the theory that the orbits are circular, a proposition that seems to many (as it seemed to Aristotle) so self-evident that it scarcely would require support. The example is especially interesting because it illustrates a change from an organizing hypothesis that asserts circular motion to the present state of affairs, a methodological principle which prefers circles to ellipses, other things being equal. The same evolution from organizing hypothesis to methodological principle can be seen in the history of the Contrast Principle in phonology (mentioned briefly in section 1.1 above). The reverse development, from methodological principle to organizing hypothesis, is not unknown

either; I shall suggest an example shortly. The history of Kepler's First Law illustrates another sort of evolution as well--a change from an organizing hypothesis to an arguable proposition of the ordinary sort. Clearly, when first put forth, Kepler's First Law was a fundamental thesis about astronomy, revolutionary in its content. Once accurate instruments of the required type had been developed, however, the difference between circular and elliptic motion could be detected by normal methods; and soon it became possible to derive Kepler's laws of planetary motion from Newton's laws, so that Kepler's First Law became a relatively low-level hypothesis in a network of assumptions.

The remaining examples of organizing hypotheses are linguistic. First, the "requirement that transformations preserve meaning", as it is phrased by Partee (to appear). I shall refer to this hypothesis as the Post Office Principle, on the ground that it treats syntax as an elaborate delivery system for messages, a system designed to get messages to an addressee without changing their content. As Partee notes, the Post Office Principle is viewed as a methodological principle by Katz and Postal (1964, 157), who stress that the principle is "not...a statement in linguistic theory, but rather...a rule of thumb based on the general character of linguistic descriptions". The Post Office Principle seemed, in case after case, to recommend analyses that were later confirmed by independent evidence, so that it was elevated from a methodological principle to an organizing hypothesis. As Partee puts it, the principle "gained support very quickly, to the point where it was widely accepted as one of the more solidly established generalizations in linguistic theory and used as a criterion for transformational rules."

As is typically the case with organizing hypotheses, it is difficult to formulate the Post Office Principle precisely (the principle, as Partee points out, involves the difficult but fundamental notion of synonymy in an essential way, just as Newton's First Law involves the difficult but fundamental notions of motion and force in an essential way), and it is hard to adduce convincing evidence for or against the principle. The problem is that it is almost always possible to fix up a description so that it will conform to the principle. Under the circumstances, whether an analyst will make the required adjustments or not tends to depend on whether or not he believes in the Post Office Principle.

My final example of an organizing hypothesis is the one referred to in the title of this article, the Substance Theory of Semantic Primes. In the form I shall use in the remainder of this paper, the hypothesis is: Every semantic prime is realizable as a lexical unit (root, inflection, or derivational affix) in some natural language. A stronger version might be suggested: In any language, most semantic primes are realized as lexical units. The strongest form of the hypothesis--in any language, all semantic primes are realized as lexical units--seems clearly too much to hope for. I shall be content to defend the weak, or simple existential, form of the hypothesis in the sections to follow.

The idea behind my name for this hypothesis is that every semantic prime is a real substance (a root, inflection, or derivational affix), not merely a principle manifested by real substances. The analogy here is with the modern view of chemical elements, which supposes them to be realizable as substances, as opposed to the ancient "elements" fire, air, earth, and water, or the alchemical "elements" salt, sulphur, and mercury, which were "not substances at all, but metaphysical abstractions of properties, typifying the natures of bodies" (Partington 1948, 113).

Clearly, the Substance Theory is an organizing hypothesis, rather than a methodological principle or an arguable proposition of the usual sort. It is difficult to see how one could construct a straightforward argument for or against the idea. And the reference to realization makes precise formulation of the hypothesis a formidable task.

2. The Substance Theory. In the remaining section of this paper, I review briefly the (very sparse) literature on semantic primes, preparatory to considering uses of the Substance Theory in discussions of semantics. Next, I take up the analogy with chemistry and argue that the analogy is material, to use Hesse's (1966) term. Finally, I supply a more general discussion of metaphor and analogy in linguistics, with additional examples of material analogies.

2.1. Semantic Primes. The statement of the Substance Theory in Section 1.2.2 refers specifically to "semantic primes" and therefore locates the hypothesis within the broad framework of Generative Semantics. This restriction is unnecessary, however, for the hypothesis is equally appropriate within theories that assume that the semantic readings of lexical units are constructs of primes called "features", "markers", "specifications", or the like. That is, I intend my remarks to apply not only to systems like those of McCawley (1968) and Lakoff (1970), in which semantic structures are of the same type as syntactic structures, but also to standard Katz-Fodor semantics (as presented in Katz (1966), for example), in which semantic representations of lexical units are sets of markers, as well as to various intermediate positions in which semantic representations of lexical units are more or less complex structures containing markers (such extensions of, variants of, or alternatives to the Katz-Fodor position as Weinreich (1966), Gruber (1965), Leech (1969), and Chafe (1970)).

Within none of these frameworks has there been any extended discussion of the character of the atomic units that appear in semantic descriptions. The following remarks by Katz (1966, 155-6 and 157) are representative:

> Just as the meaning of a word is not atomic, a sense of a word is not an undifferentiated whole, but, rather, has a complex conceptual structure. The reading which represents a sense provides an analysis of the structure of that sense which decomposes it into conceptual elements and their interrelations.

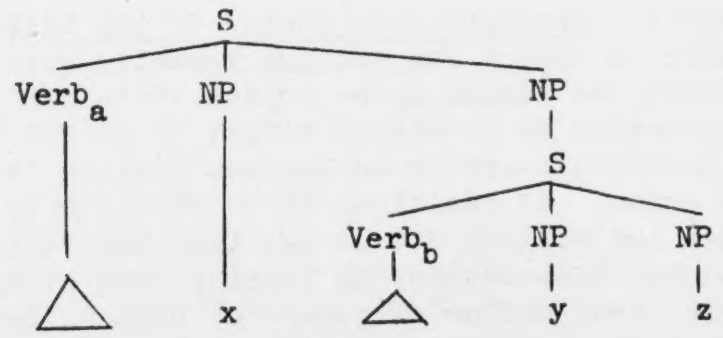
> Semantic markers represent the conceptual elements into which a reading decomposes a sense. They thus provide the theoretical constructs needed to reconstruct the interrelations holding between such conceptual elements in the structure of a sense.
>
> ...Just as syntactic markers enable us to formulate empirical generalizations about the syntactic structure of linguistic constructions, so semantic markers enable us to construct empirical generalizations about the meaning of linguistic constructions. For example, the English words 'bachelor', 'man', 'priest', 'bull', 'uncle', 'boy', etc., have a semantic feature in common which is not part of the meaning of any of the words 'child', 'mole', 'mother', 'classmate', 'nuts', 'bolts', 'cow', etc. The first set of words, but not the second, are similar in meaning in that the meaning of each member contains the concept of maleness. If we include the semantic marker (Male) in the lexical readings for each of the words in the first set and exclude it from the lexical entries for each of the words in the second, we thereby express this empirical generalization. Thus, semantic markers make it possible to formulate such generalizations by providing us with the elements in terms of which these generalizations can be stated.

In practice, primes are set up within some narrow area of interest to the investigator, as a way of giving an account of the semantic relationships he perceives in that area (see e.g. Fillmore (1969)). There is virtually no attempt to argue for one system of primes over various possible alternatives. The only areas which have been "mapped" well in this way are inflectional categories and a few fields of interest to anthropologists as well as linguists--folk taxonomies, kinship systems, and color terms. Otherwise, these investigations are in their infancy, and surely the most-quoted words on the subject are those of Bendix (1966, 17): "a rough road into the empirical semantic wilderness is preferable to a well-paved one timidly skirting the borders".

For my purposes here, the most notable gap in existing treatments of semantic primes is the absence of assertions of formal or substantive universals involving them.[1] There are the same few exceptions as before, kinship and color terms especially. In the absence of such assertions, we must try to infer general principles from such practice as there has been.

Prior to this, a few words are necessary about the differences between words and semantic primes. There is a reasonably clear illustration of the distinction in Postal (1970, 113-4):

> I have claimed that the underlying structure of <u>remind</u> clauses is of the form:



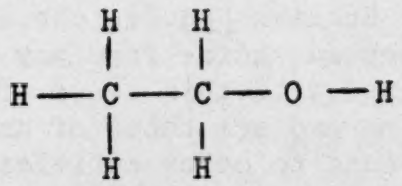
where $Verb_a$ is an element like strike, $Verb_b$ an element with the properties of a Similarity Predicate. In the context of the discussion of Generative Semantics, it is clear that there is no suggestion that these underlying verbals are lexical items, in particular none that they are the lexical strike, resemble, etc. The idea is that the underlying elements are semantic verbs, that is, predicates. Consequently, the claim is only that the underlying elements of remind clauses are those predicates which are lawfully connected to the various regularities documented for strike and Similarity Predicates. In particular, I would like to emphasize that it is not excluded that the actual lexical verb strike may have certain special properties not associated with the underlying predicate or predicate complex which shows up as the Surface Verb remind. Just so, the particular predicate of similarity which underlies remind may lack some ad hoc features of any or all of the verbals similar, resemble, like. In short, I have not intended to claim that remind is in any sense derived from underlying structures which contain the lexical verbs strike, or resemble/similar/like. Rather, I have argued that the derivation must be from elements whose properties are included in these lexical elements.

The crucial notion in discussions of primes and words is that of realization, or correspondence to; English and (in one of its senses) realizes the prime AND^2 because, aside from any syntactic or stylistic peculiarities associated with this sense of English and, the properties of this sense of and are those of an entity which bears certain specific relations to other entities (e.g. OR, NOT, IF, ONE) which, taken together, form the basis for a semantic description of English. Among the relations in question is the duality of AND and OR--that AND is equivalent to NOT-OR-NOT, and, conversely, that OR is equivalent to NOT-AND-NOT, or stated precisely, that R AND S is equivalent to NOT ((NOT R) OR (NOT S)) and that R OR S is equivalent to NOT ((NOT R) AND (NOT S)). Just as and corresponds to AND, so similar corresponds to (realizes)

LIKE, become and -en correspond to INCHOATIVE, and say to ASSERT.

2.1.1. The Substance Theory in the Literature. The first fact here is that a run through semantic descriptions in the literature has turned up no primes which strike me as being incapable of realization in a word or affix; in nearly every case, in fact, there is an obvious English lexical item corresponding to the prime. In addition, it is undoubtedly significant (as James Heringer has pointed out to me) that the factors governing selectional restrictions in English seem always to have easy "English translations"--(concrete) object, feminine, human, activity, to cite a few. If there is not necessarily a lexical unit corresponding to each prime, then we should expect to come across "inexpressible" selectional restrictions, which would require the invention of new technical terms for the purposes of linguistic description.

Although there are no examples now available of semantic primes that are not realizable in a word or affix, both Katz and Lakoff have taken pains not to subscribe to the Substance Theory. Although both assume that the set of semantic primes, like the set of phonological features, is universal, neither is willing to assert more than that the set of primes together is sufficient to provide an adequate account of the internal meaning relationships in the lexicon of any language. Katz (1966, 156) even supplies the chemical analogue:

> It is important to stress that, although the semantic markers are given in the orthography of a natural language, they cannot be identified with the words or expressions of the language used to provide them with suggestive labels. Rather, they are to be regarded as constructs of a linguistic theory, just as terms such as 'force' are regarded as labels for constructs in natural science. There is an analogy between the formula for a chemical compound and a reading (which may be thought of as a formula for a semantic compound). The formula for the chemical compound ethyl alcohol,
>
> 
>
> represents the structure of an alcohol molecule in a way analogous to that in which a reading for 'bachelor' represents the conceptual structure of one of its senses. Both representations exhibit the elements out of which the compound is formed and the relations that form it. In the former case, the formula employs the

> chemical constructs 'Hydrogen molecule', 'Chemical bond', 'Oxygen molecule', etc., while in the latter the formula employs the linguistic concepts '(Physical Object)', '(Male)', '<Selection Restriction>', etc.

Lakoff (1970, 351) finds himself asking whether there are two semantic primes WURF and GLIP with certain specified properties; he concludes:

> In an arbitrary system, one could always make up such predicates, but that is beside the point. The question here is an empirical one. Is there any evidence that such atomic predicates actually exist in the logical forms of sentences of natural language? This does not necessarily mean that there must actually be in some language single lexical items directly corresponding to these predicates. However, it is required, at the very least, that such predicates appear elsewhere. For example, there might be a number of other verbs which can be decomposed in terms of one or the other of these predicates.

Lakoff does not claim that the Substance Theory is invalid; he merely withholds judgment in the matter and proposes a weaker condition on the universality of primes. The only thing that his condition rules out is the positing of a prime on the basis of properties of one lexical item in one language--surely a minimal constraint on the content of semantic theory.

In one instance, Lakoff uses the existence of a word corresponding to a putative prime as evidence for the prime's existence. In connection with the proposed decomposition of one sense of persuade into CAUSE-INCHOATIVE-INTEND, he writes (Lakoff 1970, 342):

> Aside from the rule of predicate-lifting, all of the rules used in this derivation and in similar derivations are needed anyway in English grammar. Moreover, structures like [the one proposed for persuade] are also needed independently in English grammar. That is, there must be a verb "cause" which is a two-place predicate, a verb "come about" which is a one-place predicate, and a verb "intend" which is a two-place predicate.

If there were no reason to suppose that primes were realized as words, then the existence of a verb cause in English would be irrelevant to the analysis of persuade as containing the prime CAUSE.

Since Katz and Lakoff do not suggest any analyses that violate the Substance Theory, we must turn to others for examples. As it turns out, some relevant work has been done by logicians.

2.1.2. Logically Adequate but Linguistically Unnatural Systems. It has been the goal of logic to construct precise and satisfying accounts of a few areas of form and meaning, of independent philosophical or mathematical interest. One of the criteria for satisfaction is systematic elegance--parsimony in primitive symbols or concepts, in sets of axioms, and so on. Logicians have been extremely ingenious in their parsimony. And their systems are often quite unnatural linguistically. Linguistic judgments of unnaturalness, in combination with predictions made by the Substance Theory, allow us to conclude that the logician's primes cannot be linguistic primes. I provide two cases here.

First, the Sheffer stroke.[3] A classic result of symbolic logic is that the logical connectives ~ 'not', & 'and', v 'or', ⊃ 'implies', and ≡ 'if and only if' can all be defined from one connective (either one of two different connectives, in fact). This is the Sheffer stroke | 'not both...and...'. The remaining connectives are definable in several ways, for instance

~ P	defined as	P|P
P v Q	defined as	~P|~Q
P ⊃ Q	defined as	~PvQ
P & Q	defined as	~(~Pv~Q)
P ≡ Q	defined as	(P⊃Q) & (Q⊃P)

What is linguistically interesting about this logician's strategy is that no language seems to have a conjunctive root nub, with the property that A nub B means 'not both A and B', and I would view with considerable suspicion any report of language with such a conjunction. If no language has a lexical unit nub, then according to the Substance Theory, the Sheffer stroke cannot represent a semantic prime for linguistic, as opposed to logical, purposes.

An example of somewhat different type is provided by Prior (1960), whose object is to assail the notion that the meaning of the word and is completely given by an account of the role it plays in deductions (that from P and Q we can infer P; that from P and Q we can infer Q; and that from P and Q we can infer P and Q). He affects to claim that any statement Y can be inferred from any other, X, by citing an inference of the form:

X
X tonk Y
∴ Y

Prior adds (p. 39):

> There may well be readers who have not previously encountered the conjunction 'tonk', it being a comparatively recent addition to the language; but it is the simplest matter in the world to explain what it means. Its meaning is completely given by the rules that (i) from any statement P we can infer any statement formed by joining P to any statement

> Q by 'tonk'...and that (ii) from any 'contonktive' statement P-tonk-Q we can infer the contained statement Q.

Not only is tonk not a "comparatively recent addition to the language", it is not part of any language. Consequently, whatever it might be, it is no semantic prime (according to the Substance Theory). Belnap (1962) has observed that tonk is inconsistent, thereby providing an explanation for its unnaturalness.

The point of cases like the preceding two is that the Substance Theory can link with observations about what sort of lexical items occur in the world's languages to yield predictions about possible semantic primes. Without the mediation of the Substance Theory, there is no reason for there to be a relation between the kinds of lexical units that occur in languages and the semantic primes that are proposed for them.

2.2. The Analogy with Chemistry. The Substance Theory of Semantic Primes is analogous to Boyle's requirement, in the "Sceptical Chymist" of 1661, that chemical elements must be isolable subs ances, not abstract principles, as I have already pointed out. We have also seen Katz's comparison of semantic structure to chemical structure. In this section, I will press this analogy further, with the intention of using the chemical case to suggest useful lines of inquiry in the linguistic case. That is, I will be claiming that the parallels between chemical structure and semantic structure are deep ones. This is not to say, of course, that the parallel is complete, that the two subfields of the different disciplines are isomorphic in every detail. I do not anticipate the discovery of a set of deep principles from which the properties of chemical structure and those of semantic structure will both be derivable. Indeed, there are aspects of each subfield which are without obvious analogues in the other; for instance, there is nothing in the chemical case that is a natural correspondent of the phonological identity that unites the two senses of persuade (CAUSE-INCHOATIVE-INTEND and CAUSE-INCHOATIVE-BELIEVE), or the distinct senses (each a separate lexical unit) of many other words.

The initial analogy is of language to matter. The strategy of the disciplines, linguistics and chemistry respectively, is to analyze heterogeneous physical material (speech, materials) into its parts (words, substances), then to treat these parts as either elemental substances (semantic primes, elements) or compounds of such elemental substances. These analytic preliminaries require the identification and removal of various kinds of intrusive factors.

The central part of the analogy, then, is of an occurrence of a semantic prime in some language, on the one hand, to an atom of some chemical element, on the other. To lexical entries correspond molecules.[4] Certain molecules, hydrogen molecules for instance, are composed of only one sort of atom. In the same way, certain lexical entries, the entry for cause for instance, are composed of only one sort of prime. Other molecules, the sulphuric acid

molecule for one, possess an internal structure in which more than one sort of atom (hydrogen, sulphur, oxygen) occurs. Just so, some lexical entries, the entry for kill among them, possess an internal structure in which more than one sort of prime (CAUSE, INCHOATIVE, DEAD) occurs.

In linguistics as well as chemistry, the great majority of the known substances (or words) are complex. In each field, the number of actually occurring substances is quite large, and the number of possible substances is infinite in principle, though limited in fact by external factors (the physical instability of the molecules, the psychological complexity of the words).

Also, in linguistics as well as chemistry, there are molecular properties which are "emergent", in the sense that they are not predictable by known principles from the character of the constituents of the molecule. C. D. Broad (1925, 62-3) writes of a familiar chemical example:

> Oxygen has certain properties and Hydrogen has certain other properties. They combine to form water, and the proportions in which they do this are fixed. Nothing that we know about Oxygen itself or in combination with anything but Hydrogen could give us the least reason to suppose that it could combine with Hydrogen at all...And most of the chemical and physical properties of water have no known connexion, either quantitative or qualitative, with those of Oxygen and Hydrogen. Here we have a clear instance where, so far as we can tell, the properties of a whole composed of two constituents could not have been predicted from a knowledge of these properties taken separately, or from this combined with a knowledge of the properties of other wholes which contain these constituents.

The linguistic analogue is the apparent impossibility of predicting the full range of syntactic properties of a lexical item given its decomposition into primes; from what semantic analysis of the verb question could one predict that it can be used performatively only when its direct object is a simple NP (as in I question that statement) or a whether-clause (as in I question whether we should do this), but not when it is any other sort of wh-clause (*I question where he lives) or a that-clause (*I question that he was responsible) or an if-clause (*I question if we should do this)?

In the quantitative atomic theory proposed by Dalton, it is assumed that the atoms of the same element are identical, in the sense that they have identical masses, and that atoms of different elements have different masses. The corresponding assumptions in semantics are that instances of the same semantic prime are associated with the same cognitive meaning (i.e., that the cognitive meaning of a semantic prime is invariant across languages), and that different semantic primes have different meanings.

The tasks of chemistry are partly analytical (to devise methods for isolating and identifying substances), partly descriptive

(to say what sorts of substances occur, and what their properties are), and partly explanatory (to give an account of chemical structure from which the observed phenomena could be predicted). The analytical and descriptive aspects of elemental theory are summarized well in Weeks (1968), from which I conclude that semantics is a few hundred years behind chemistry, simply in the matter of listing elements, not to mention explaining their properties. It is as if we were really sure of only a dozen or so chemical elements. Semantics has had no Mendeleev to organize the elements in a periodic table according to their salient common properties; and the linguistic analogue of the Bohr atom, from which the groupings in the periodic table could be predicted, is scarcely imaginable.

If the structural analogy between chemistry and semantics is deep, what sorts of developments can we expect in semantics? Three, at least: the discovery of isotopes, a theory of valence, and the hypothesis of subatomic structure. I believe that there are indications that all three of these expectations are fulfilled.

First, isotopes. The discovery of different atoms of the "same" element with different masses (and even of atoms of "different" elements with the same mass) is an obvious embarrassment for a theory which takes an invariant mass to be criterial for a given element. The existence of isotopes, especially those which (like light and heavy hydrogen) have quite distinct properties, makes the study of subatomic structure inevitable. What are the semantic analogues of isotopes? They would be occurrences of the "same" semantic prime with different meaning. Just this sort of situation is exhibited by lexical items which are "denotatively" distinct, but do not differ in any independently motivated semantic feature; these are terms for correlative species, for example rose, chrysanthemum, and pansy, or snap, crackle, thud, and rumble (the latter cases from the discussion in Leech (1969, 85-9)). It is natural to say that these items represent only two semantic primes ([SPECIFIC] FLOWER and MAKE A [SPECIFIC] NOISE) and that the individual lexical items differ subatomically.

Next, a theory of valence, a set of combinatory principles for semantic primes. Among these principles in semantics are conditions stating that a certain predicate "takes" so many arguments, of such and such a type; these conditions have been much studied by Fillmore (see, e.g. Fillmore (1970)), among others. Also, conditions governing the embedding of one S into another--the deep structure constraints of Perlmutter (1968), restrictions on the occurrence of special classes of predicates, such as the stative and activity predicates, constraints against certain predicates embedding themselves (*TRY to TRY, *INTEND to INTEND), and the like.

Finally, subatomic structure. This is already called for by the isotope cases, and might serve to explain the valence phenomena. It could also provide an account of the way in which primes fall into subclasses having properties in common (a set of connectives, like AND and OR; a set of modal elements, like NECESSARY and POSSIBLE; and so on). There are in addition a number of relationships among primes that might be accounted for by means of

by Swadesh and discussed so clearly by Lees (1953, 113-4):

> The members of the chosen subset may be likened to the (indistinguishable) atoms in a given mass of a radioactive element. Since the rate of disintegration is predictable at any time during observation of the sample, the mass (or number of remaining atoms) of the element remaining among the decay products at any time in the sample is a measure of how long the sample has been decaying. The analysis of decay products in mineral samples permits the calculation of the age of the earth's crust. Similarly, analyses of morpheme decay products should provide an absolute chronology for lexical history.

This analogy turns out to have several faults: morpheme decay probably does not proceed at a constant rate, and even if it did, the resulting estimates of absolute chronologies would normally not be exact enough for ordinary linguistic purposes. Nevertheless, the analogy is close enough to have inspired some quite important research, and in special cases glottochronological methods are still useful.

Analogies of many kinds were a fancy of 19th-century writers on language. In the following passage, Whitney (1867, 46-7) spoke more truly than he could have known:[7]

> There is a yet closer parallelism between the life of language and that of the animal kingdom in general. The speech of each person is, as it were, an individual of a species, with its general inherited conformity to the specific type, but also with its individual peculiarities, its tendency to variation and the formation of a new species. The dialects, languages, groups, families, stocks, set up by the linguistic student, correspond with the varieties, species, genera, and so on, of the zoölogist. And the questions which the students of nature are so excitedly discussing at the at the present day--the nature of specific distinctions, the derivation of species by individual variation and natural selection, the unity of origin of animal life--all are closely akin with those which the linguistic student has constant occasion to treat. We need not here dwell further upon the comparison: it is so naturally suggested, and so fruitful of interesting and instructive analogies, that it has been repeatedly drawn out and employed, by students both of nature and of language.

Whitney cites Lyell and Schleicher as additional proponents of the proportion:

subatomic structure--the duality relation of NECESSARY-POSSIBLE, REQUIRE-PERMIT, AND-OR, and SOME-EVERY, for instance, or the relation between non-epistemic BE FREE TO and epistemic POSSIBLE (both realized as English can) and between non-epistemic HAVE TO and epistemic NECESSARY (both realized as English must). In his treatment of semantic primes, Grosu (1970, 41) adopts a theory of subatomic structure without comment by deciding "to represent them as bundles of semantic and syntactic properties"; he includes (84-9) a tentative list of such properties (of types already mentioned) for seven putative primes, CAUSE, INCHOATIVE, TRY, INTEND, BE ABLE TO, BE FREE TO, and HAVE TO.

In his discussion of the sort of emergence illustrated earlier in this section, Nagel (1961, 366-74) observes that emergence is relative to a particular theory, so that as theories change, it may become possible to predict properties that were inexplicable within a previous theory. He notes that a change of this sort has occurred in chemistry, where properties of substances which were formerly thought to be emergent now can be predicted from an electronic theory of atomic composition. It is even possible to imagine that all properties of interest to chemists and still considered emergent might be predictable. The rather breath-taking linguistic analogue is that there might turn out to be no syntactic exceptions, that the behavior of every lexical item with respect to syntactic rules and constraints might be predictable in some way from its semantic structure.[5]

2.3. Analogy and Metaphor. I have claimed that the parallel between chemical structure and semantic structure is systematic enough to merit study, hence that it is like the parallel between water waves and electromagnetic phenomena, which is treated at length by Hesse (1966) in her very interesting work on models and analogies. She draws a distinction between metaphors, which are suggestive, but not productive, and material analogies, which function to provide models for inquiry.

Merely metaphoric are such names as the "Post Office Principle" and the "Free Ride Principle", or Ross' "tree-pruning" (Ross 1969) and "Pied Piping" (Ross 1967, Section 4.3). More information about the way the U.S. Post Office operates is not likely to further the study of the requirement that transformations preserve meaning,[6] and arboricultural research will not elucidate problems of derived constituent structure.

To round out this discussion, I will contrast some instances of merely metaphorical writing with examples of more illuminating analogies, choosing now non-transformational illustrations.

For the unsatisfying cases, I have selected ideas of two of the most original and inspiring traditional grammarians, Noreen and Jespersen. Lotz (1966, 58-9) summarizes Noreen's theory of the structure of grammar as follows:

> Thus, grammar should have three branches, each of which should view the entire speech phenomenon from a special angle: phonology, which should treat the articulated

> sound; semology, which should deal with the linguistically formed psychological content; and morphology, which should account for the way in which the sound material is formed to express the semantic content. He attempted to elucidate these distinctions by analogies, e.g. a certain object can be regarded as a piece of bone (material), having the shape of a cube (content), and serving as a dice (form); or, as a building composed of bricks (material), in Moorish style (content), and serving as a café (form). But these analogies are rather far-fetched and not very illuminating.

And McCawley (1970, 447) attacks Jespersen's poetic attempts in Analytic Syntax (1969, 120-1) to distinguish the notions of nexus and junction: "In AS, his characterizations of nexus and junction rest heavily on analogies which I find unenlightening"; compare the corresponding analogies in Jespersen (1924, 116):

> Comparisons, of course, are always to some extent inadequate, still as these things are very hard to express in a completely logical or scientific way, we may be allowed to say that the way in which the adjunct is joined to its primary is like the way in which the nose and the ears are fixed on the head, while an adnex rests on its primary as the head on the trunk or a door on the wall. A junction is here like a picture, a nexus like a process or drama.

In the same work, Jespersen strives to account for the relationships of modifiers by means of an analogy less striking than he had hoped it would be (p. 108):

> ...it is really most natural that a less special term is used in order further to specialize what is already to some extent special: the method of attaining a high degree of specialization is analogous to that of reaching the roof of a building by means of ladders: if one ladder will not do, you first take the tallest ladder you have and tie the second tallest to the top of it, and if that is not enough, you tie on the next in length, etc. In the same way, if widow is not special enough, you add poor, which is less special than widow, and yet, if it is added, enables you to reach farther in specialization; if that does not suffice, you add the subjunct very, which in itself is much more general than poor.

For an instance of a more productive analogy, consider the parallel between replacement of vocabulary items in a language over time and the decay of radioactive elements, a parallel first emphasized

species : variety = language : dialect

and of the related parallels between genetic classification in linguistics and biological taxonomy, although Whitney nevertheless castigates Schleicher for attempting "to prove by its aid the truth of the Darwinian theory, overlooking the fact that the relation between the two classes of phenomena is one of analogy only, not of essential agreement" (p. 47).

Now, in fact, the analogy is a deep one. Here, in detail, are the structural features the two cases have in common: There is a population of individuals, which vary in a number of characters (linguistic or morphological). The individuals form themselves into a number of groups on the basis of their similarities in characters. There is also an ability for certain pairs of individuals to interact in a special way, if they are brought together (their speech is mutually intelligible, in the linguistic case, or they can (inter)breed, in the biological case). The interactive ability is then used scientifically as a necessary and sufficient test for determining groups within the population (in the linguistic case, mutual intelligibility is used as a stringent criterion for a language, and in the biological case, ability to interbreed is used as a stringent criterion for a species).

Several developments of these notions can be predicted. The first is that it will frequently not be possible to confront the appropriate pairs to test relationships. Thus, biological specimens may be dead, or geographically separated, or ecologically separated; and languages may be defunct or far-flung. In both fields, the consequence is the development of an independent notion of relationship, one based solely on the characters. In the case of biology, this is the "morphological" species, as opposed to the "biological" species (see inter alia Cain (1954)). In the case of linguistics, this is the Stammbaum principle of genetic classification, as opposed to a sociolinguistic classification. The new, or "strict", theory is easily seen to be unsatisfactory, because the characters will show a considerable degree of independence; hence, a Wellentheorie in linguistics and a theory of diffusion of characters through gene pools in biology.

Another, less predictable, characteristic of the systems we are considering is that the stringent criterion turns out not to characterize a transitive relation. That is, evidence will arise indicating that the criterion is not necessary, but merely sufficient. In the case of biology, we have animal chains in which each animal can breed with the animals in the adjoining territory, although the animals at the extremes cannot interbreed (a readable exposition occurs in Dobzhansky (1955, chapter 8)); in the case of a "species" of gulls surrounding the North Pole, the extremes happen to occur in the same area and cannot interbreed. The linguistic analogies are well-known cases where groups of speakers each find their dialect mutually intelligible with their neighbors but where the extreme dialects are not intelligible to each other. Indeed, knowing the case of the gulls we might have been able to predict the existence of problematical dialect-chains.

The analogy between linguistic and biological classification is a systematic one; in most respects, there is a point-to-point correspondence between the two fields. The claim of earlier sections of this paper is that the correspondence between semantic and chemical structure is of the same sort.

Footnotes

*Versions of this paper were read at The Ohio State University in November 1970 and before the Chicago Linguistic Society in December 1970, and were greeted by a spirited rejection, on the part of several auditors, of some of my claims. Many people have provided useful comments and criticisms; I am especially indebted to Gaberell Drachman, James Heringer, Jerrold Sadock, and Ann Zwicky. The Substance Theory (independent of the chemical analogue) was first suggested to me in 1965 by George Boolos; in the intervening years I have had the opportunity to reconsider my initial scepticism about the idea.

[1]Chomsky's (1965) mentions of semantic universals are quite brief: "A theory of substantive universals might hold for example, that certain designative functions must be carried out in a specified way in each language. Thus it might assert that each language will contain terms that designate persons or lexical items referring to specific kinds of objects, feelings, behavior, and so on" (p. 28). As formal universals, he suggests "the assumption that proper names, in any language, must designate objects meeting a condition of spatiotemporal contiguity, [a footnote here illustrates the hypothesis] and that the same is true of other terms designating objects; or the condition that the color words of any language must subdivide the color spectrum into continuous segments; or the condition that artifacts are defined in terms of certain human goals, needs, and functions instead of solely in terms of physical qualities" (p. 29). In the same vein, James Heringer has suggested to me the hypothesis that words in natural (as opposed to technical) languages never refer to absolute measurements.

[2]Henceforth, I shall follow the custom of using all caps for primes, as contrasted with italics for words or other lexical units.

[3]Almost every standard logic text treats this subject; see, e.g. Copi (1967, 201).

[4]This much of the parallel is echoed by Postal (1970, 100-1), who speaks of "semantic atoms" and "semantic molecules" but without taking these terms to be more than simple metaphors.

[5]Exactly this hypothesis has been made to me by Georgia Green in conversation.

[6]Although I c.. ot resist pointing out that structures in violation of deriva..onal constraints are the analogues of pieces of mail returned to the sender.

[7]The passage is sandwiched between an analogy relating linguistic history and organic growth and decay, and one associating earlier stages of a language with geological strata.

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On Perceptual and Grammatical Constraints

Alexander Grosu

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0.0. In "The Cognitive Basis for Linguistic Structure," T. G. Bever suggests that "some so-called 'output conditions', 'derivational constraints' and/or 'interpretive rules' are formalizations of behavioral constraints." He further remarks that by removing such powerful devices from the grammatical apparatus proper and by viewing them as perceptual in nature, "grammatical simplicity and purity would be purchased at the expense of descriptive power granted to other aspects of sentence description," and chiefly, the study of grammar would not reduce "to an unrevealing taxonomy". It is the purpose of this paper to follow up Bever's remarks in a few concrete cases involving derivational constraints, as well as devices of even greater power which had not yet been proposed at the time when Bever's article was written, namely, transderivational constraints.

0.1. A few preliminary remarks are in order at this point. First, it would be unreasonable to expect that there be a fool-proof test which enabled us to decide whether any given constraint is grammatical or perceptual. I believe, however, that there are signs which may help us make a decision. For one thing, some, although not all, native speakers are capable of distinguishing between unacceptability and ungrammaticality on intuitive grounds. Furthermore, the unacceptability resulting from the violation of a perceptual constraint seems to increase in severity as the value of some parameter, like the length of a constituent, is varied, while instances of violation of grammatical constraints usually have a yes/no character. Notice that this phenomenon is different from those considered by Chomsky and other writers in their discussions on "degrees of grammaticality," since they were concerned with comparing the inadmissibility of constructions in which <u>different</u> kinds of requirements had been violated, while I am concerned with varying degrees of admissibility in cases where <u>the same</u> kind of constraint has been violated.

0.2. Second, we should notice that Bever makes his claim in relation to <u>some</u> constraints. Indeed, there is no reason for assuming <u>a priori</u> that <u>all</u> constraints should be reducible to cognitive limitations, since there is a large body of purely syntactic cases, outside of the phenomena considered here, and it is perfectly possible that some derivational and transderivational constraints may not involve perception. As an example of a phenomenon that I regard as purely syntactic, consider the fact that some languages have pre-nominal, while others have post-nominal, modifiers; I do not see here what the distinction could have to do with perception.

Another important word in Bever's formulation is formalizations. Indeed, although behavioral constraints reflect limitations of the perceptual apparatus and must therefore be assumed to be universal, it does not follow that they must be manifested as merely perceptual in all languages. The reason is that some languages may have "grammatized" specific constraints, with the result that constructions of increasing complexity no longer lead to increasing unacceptability, but rather exhibit a partition into grammatical and ungrammatical constructions, with the cut-off point often arbitrarily located way below the limit of processability. As a case in point, consider the decreasing intelligibility of increasingly complex pre-nominal modifiers, which I think may be safely regarded as a universal phenomenon. Now, German tolerates highly complex pre-nominal modifiers, particularly in writing, while English sets a fairly low cut-off point. The German sentence in (1a) is not at all an extreme example; however its perceptual difficulty can be appreciated by examining (1b), a literal English rendering, which is extremely hard to interpret, in addition to being ungrammatical. It appears that German, unlike English, has not grammatized the constraint, since complex adjectival constructions can be used up to (and even beyond!) the limit of intelligibility.

(1a) Die während der Nacht mit dem aus Frankreich kommenden Zug eingetroffenen Touristen fanden keine Unterkunft.
(1b) *The during the night with the from France coming train arrived tourists did not find any lodgings.

That the cut-off point is fairly low in English can be seen in (2a), which is ungrammatical but easily interpretable. That the constraint is in fact grammatized can be seen by comparing (2a) and (2b), only the former of which is out, although they contain modifiers of equal complexity.

(2a) *The captain wants a ready to die volunteer.
(2b) Mary buys ready-to-wear clothes.

0.3. Third, a perceptual constraint may not be overtly manifested in specific languages if it is overridden by structural factors. In other words, a constraint will be observable only in the absence of features of language structure that may guide the processing device. Consider, for example, Bever's proposed strategy that NP-V-NP sequences are interpreted as ACTOR-ACTION-OBJECT (in fact, the interpretation mast be formulated more generally, possibly as LOGICAL SUBJECT-PREDICATE-LOGICAL OBJECT, since not all verbs occurring in this framework allow Agents). We would certainly not expect this strategy to apply to languages with overt case markers, where the position of NPs is not crucial in determining their roles.

1.0. Let us begin our substantive discussion by considering Postal's cross-over phenomena, which were initially formulated as a constraint on movement transformations, but which I understand Postal would

want reformulated as a derivational constraint, presumably involving underlying structure and some intermediate derivational stage or stages. I shall confine my attention to the so-called "A-movements" (which do not make crucial use of variables), as represented by the rules of PASSIVE, FLIP, ABOUT-MOVEMENT, SUBJECT-RAISING and TOUGH-MOVEMENT, as I do not understand very well what goes on in the B-movements. The inadmissible structures resulting from the application of the five rules mentioned above in cases where some NP crosses over another with which it is coreferential are exemplified in (3) - (7).

(3a) John stabbed himself.
(3b) *John was stabbed by himself.
(4a) I am amazed at myself.
(4b) ?I amaze myself.
(5a) I talked to John about himself.
(5b) *I talked about John to himself.
(6a) It seems to me that I am stupid.
(6b) *I seem to myself to be stupid.
(7a) It is difficult for me to shave myself.
(7b) *I am difficult for myself to shave.

If the cross-over constraint exhibited in (3) - (7) is perceptual, it has certainly been grammatized in Postal's speech, as well as in a large number of dialects of English and in some other languages. Postal notes, however, that the phenomenon is by no means universal. On the other hand, it might not be too easy to detect the constraint in those dialects and/or languages in which it does not have grammatical status, as the b-sentences in (3) - (7) are intelligible to everybody; this suggests that the purely perceptual problems these sentences might create cannot be too serious. I believe, however, that this line of investigation is worth pursuing, for I have found native speakers of English who accept the sentences in question, but nevertheless find them mildly disturbing or slightly odd.

1.1. Let us now ask what perceptual problems could be involved in (3b) - (7b). We may begin by noticing that Bever's strategy concerning the interpretation of NP-V-NP sequences is applicable (in the more general form that I suggested above) to (3a) and (4a) since the singly understood NPs are perceived as Agent and Experiencer respectively. Bever offered some experimental evidence that although a violation of this strategy is possible, in the presence of some overt marker (like the passive form of the verb) the resulting structures are perceptually more complex, or, to put it somewhat differently, "marked." In (6a) and (7a), the superficial segmentation is NP-V-NP-NP, the last NPs being a full clause and a subjectless infinitival phrase respectively. However, given the lexical data that seem and difficult are two-place predicates and that their logical Subject is an Experiencer, the first NP, it, is interpreted as a dummy and disregarded in role-assignment. Moreover, given the additional lexical information that these predicates cannot be preceded by their Experiencer in surface structure, (6a) and (7a) are perceived as "unmarked." If we can also argue that there are

strategies based on the "natural" order of NPs (given predicates with more than two arguments) so that the natural position of the about-phrase is after the indirect object, it will be the case that all the sentences in (3a) - (7a) are perceived as unmarked, while all the (b) sentences are perceived as marked.

1.2. Notice that in the unmarked structures considered above, the left-to-right ordering of arguments overtly expresses the intuitive notion of "hierarchy of roles," since every argument both commands and precedes the arguments to its right. In (3b), (4b), and (5b), two arguments have switched places, with the result that a hierarchically lower argument bears both primacy relations to a higher one; the effect is that the referent of the lower argument is thrown into focus. In (6b) and (7b), the focusing effect is even stronger, since an NP from a lower sentence is both upgraded to the rank of clause-mate of the Experiencer and given both primacy relations over the latter. We are now ready to formulate a tentative explanation of the cross-over phenomena considered above:

(A) A hearer assumes that a marked form was used in order to focus on the referent of some NP, and concludes that this referent would not have been mentioned in that position, had the unmarked form been used.

Put differently, a marked form carries the presupposition that an NP in positional focus is not coreferential with any NP with respect to which it is focused.

1.3. If we grant (A), we are in a position to explain several problems which required fairly elaborate treatment in Postal's monograph.

1.3.1. Most informants I have consulted agree that the violation in (4b) is much less severe than in the other (b) sentences. We can explain this by pointing out that a principle like (A) depends on a hearer's ability to recognize marked forms. But flipped sentences look very much like ordinary unmarked ones, and it is only through a semantic interpretation of the arguments that a hearer can realize that the subject of the sentence is not an Experiencer. Moreover, considering that the relation between adjectives and verbs is much less regular than that obtaining between active and passive verbal forms, some informants may be unaware of a relation between (4a) and (4b), and thus fail to recognize the latter as marked.

1.3.2. Another problem arises in connection with the paradigm in (8), where both sentences exhibit violations of the cross-over constraint, but where (8a) only is unacceptable.

(8a) *I talked about Bill to himself.
(8b) I talked about myself to myself.

It seems reasonable to assume that the referent of some NP_i can be thrown into focus by appearing earlier than in the unmarked order only if there is no still earlier mention NP_j of that referent in the structure considered, such that NP_j commands and precedes NP_i. If there is such an NP_j, it grabs the limelight to itself, as it were, and although the structure constraint is technically marked, no focusing effect arises. Therefore, as the NP of the about-phrase in (8b) is both commanded and preceded by a coreferential Experiencer, (8b) does not in fact count as marked for the purposes of (A).

1.3.3. Consider now the fact that the (b) sentences (3) - (7) are no longer perceived as deviant if the singly underscored NPs bear contrastive stress, and especially if particles like even are added. For example, (9b) is much better than (9a), and (9c) is better than both.

(9a) *John was stabbed by himself.
(9b) John was stabbed by himself.
(9c) John was stabbed even by himself.

Now, one of the functions of contrastive stress is to point out some error in connection with a previously mentioned constituent, as in (10).

(10) Speaker A: I believe John gave Bill a present.
Speaker B: No, John gave Mary a present.

If the presupposition of a sentence is information assumed in advance to be true, and if the use of the passive in (9b) carries the presupposition that the second NP is not coreferential with the first, the contrastive stress serves the purpose of explicitly contradicting this assumption. (9c) is more immediately acceptable than (9b), for even suggests that John was an unlikely candidate for the role of Agent, and thus makes even clearer the presupposition of non-coreferentiality, which is ultimately contradicted by contrastive stress.

2.0. We shall now ask whether derivational constraints that do not involve surface or underlying structure can have anything to do with perception. The answer seems to be no , given Bever's assumption that intermediate stages in a derivation have no psychological reality. I do not, however, believe that Bever's assumption can be maintained in this strong form, although it seems that a weaker version can be defended. The weak and strong formulations are given below as (B) and (C) respectively.

(B) Some intermediate stages in derivations have no perceptual reality.
(C) No intermediate stages in derivations have any perceptual reality.

2.1.1. In support of (B), Bever claims that derivational and perceptual complexity do not always correlate, and offers some

experimental evidence involving agentless passives, which are easier to perceive than full passives, although an additional transformation has allegedly applied. Unfortunately, agentless passives are ambiguous between a reading on which the Agent was deleted and one on which it never existed, as can be seen in the following paradigm, discovered by Fillmore (1968):

(11a) The boy was killed with an axe.
(11b) The boy was killed by an axe.
(11c) The boy was killed.

In (11a), there is an "understood" Agent, in (11b), there is none, while (11c) is ambiguous between the readings of (11a) and (11b). Therefore, it is perfectly possible that Bever's subjects who were presented with a sentence like (11c) interpreted it as synonymous with (11b), which, given no background information, seems to be the more likely reading.

2.1.2. A more convincing argument in support of (B) could be made on the basis of Ross' discovery that violation of his constraints results in more acceptable constructions if the island crossed by some constituent is in turn "sluiced." The point is exemplified in (12) with the Coordinate Structure Constraint.

(12a) *Jill and someone were having tea, but Tom doesn't know who Jill and were having tea.
(12b) ?Jill and someone were having tea, but Tom doesn't know who.

The greater acceptability of (12b) suggests that hearers do not interpret it by reconstructing an intermediate stage like (12a), for then (12b) would be at least as difficult, possibly more difficult to process than (12a).

2.1.3. Another observation made by a number of writers which supports (B) is that multiply center-embedded constructions increase in acceptability if various transformations, e.g. Passive or Extraposition, apply to them. The effect of these two transformations can be seen in (13) and (14) respectively, where the (b) sentences are much easier to perceive than the (a) ones.

(13a) The girl the teacher the school fired flunked hit the boy.
(13b) The boy was hit by the girl who was flunked by the teacher who was fired by the school.
(14a) The rumor that the report which the advisory committee submitted was suppressed is true is preposterous.
(14b) The rumor is preposterous that it is true that the report which the advisory committee submitted was suppressed.

The relevance of (13) – (14) to (B) could be challenged by a claim that passive and extraposed structures are in fact derivationally

less complex than their active and non-extraposed counterparts respectively. I do not know of anyone who made this claim in connection with Passive; however, such a claim has been made by J. Emonds in relation to Extraposition. Notice, however, that even if Emonds' claim is accepted, there will still be instances of inverse perceptual/derivational correlation regarding complexity, because of verbs like prove, which may take a clausal subject and a clausal object. The paradigm in (15) shows that Extraposition (as traditionally formulated) is optional with prove, but results in highly unacceptable structures when the object is a that-clause.

(15a) That John told everyone he is staying proves my point.
(15b) It proves my point that John told everyone he is staying.
(15c) That Tom told everyone he is staying proves that he thinks it would be a good idea to stay.
(15d) ??It proves my point that Tom thinks it would be a good idea to stay that he told everyone he is staying.

Thus, Extraposition supports (B) regardless of the direction of movement in grammatical description, for its application sometimes increases and sometimes decreases acceptability.

2.2.1. Whatever the force of the examples offered in sections 2.1.2. and 2.1.3., it should be clear that they support (B), but not necessarily (C). In fact, there are good grounds for believing that (C) is in general incorrect, and that it can only be upheld with respect to very simple sentences, but not sentences like (16).

(16) John likes everybody, even George, and so does Mary, but Bill doesn't believe it.

In (16), the antecedent of so does is -i- likes everybody, -i- even likes George, while the antecedent of it is John likes everybody, he even likes George, and Mary likes everybody, she even likes George. It is not at all obvious how the perceptual strategies could recover the meaning of (16) in one swoop. It is highly probable that they have to operate in three stages, first reconstructing the full form of the constituent even George, then the antecedent of so does, and finally the antecedent of it.

2.2.2. We are now in a position to answer the question raised at the beginning of section 2.0., with respect to the possibility that a derivational constraint which mentions neither surface nor underlying structure be based in perception. Given the untenability of (C), the answer is clearly Yes. All that is needed is that one of the intermediate stages constructed in the process of decoding be perceptually complex. I shall use one of Lakoff's derivational constraints to argue that a sentence whose deep and surface structures are well-formed can be perceived as inadmissible if an

inadmissible intermediate stage is reconstructed by the perceptual strategies.

Lakoff mentions the following four successive stages in a derivation:

(17a) I know the kings of England and Sam knows the kings of Spain.
(17b) *I know the kings of England and Sam knows the ones of Spain.
(17c) *I know the English kings and Sam knows the Spanish ones. [where the Spanish ones means the kings of Spain, not the kings from Spain]
(17d) I know the kings of England and Sam knows those of Spain.

(17b) is ungrammatical because it contains the ill-formed surface sequence *one of NP. The interesting features of this derivation are that (17c) is ill-formed only if it is derived from (17b), and that (17d) is well-formed, although it is derived from the ill-formed (17b) and (17c).

From a perceptual point of view, the well-formedness of (17d) follows in a straightforward way from the well-formedness of its surface and deep structures. However, the ill-formedness of (17c) cannot be explained by a theory of language that assumes (C), for its surface structure is not ill-formed (since it has a perfectly acceptable reading), and neither is its underlying representation. On the other hand, the situation can be handled by a theory that does not incorporate (C), as it is possible to argue that an intermediate stage in the decoding of (17c) is the ungrammatical (17b), while no such stage is recaptured when (17d) is processed.[1]

3.0. In sections 3. and 4., I shall discuss two proposed transderivational constraints, and will argue that the formulation in purely formal terms is inadequate.

3.1. (18a) A woman who was pregnant hit a girl.
(18b) A woman hit a girl who was pregnant.
(18c) A woman hit the curb who was pregnant.

Perlmutter noticed that (18b) is not ambiguous, although one would expect it to have a reading synonymous with (18a), due to the existence of the optional rule of EXTRAPOSITION-FROM-NP. (18b) has only a continuous reading, although a discontinuous reading is in principle possible, as shown by (18c). To prevent the discontinuous reading in (18b), Perlmutter formulated a transderivational constraint roughly as follows:

(D) A derivation D is ill-formed, if EXTRAPOSITION-FROM-NP applies in D, and if the last line of D thereby becomes string-wise identical with the last line of D', where D and D' differ in semantic representation.

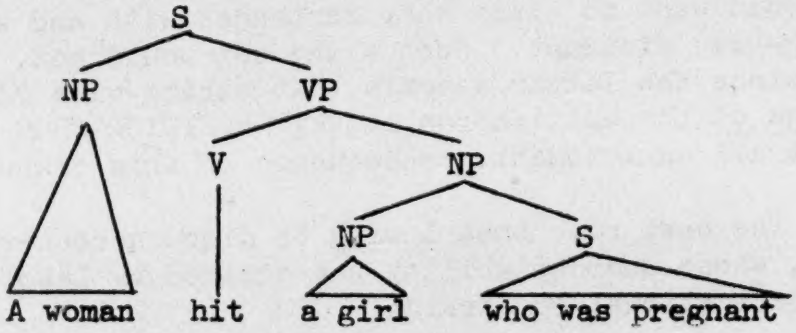
It should be pointed out that the discontinuous reading of (18b) is not universally ill-formed; thus, Arnold Zwicky reports that

this sentence is ambiguous in his dialect, although the continuous reading is far more likely. This state of affairs suggests that (D) should be reformulated as a perceptual strategy something like (E):

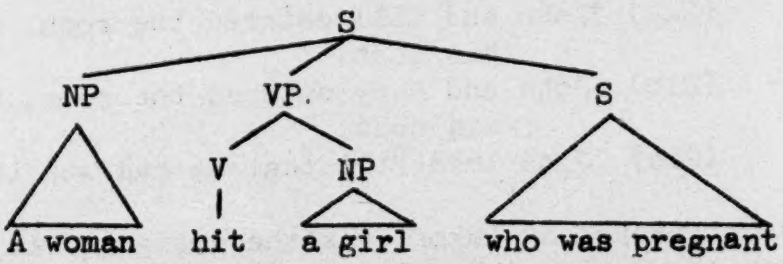
(E) In the absence of any clues to the contrary, an interpretation that involves discontinuities is rejected, if one that does not is possible.[2]

If the purpose of a transderivational constraint like (D) is to prevent ambiguities of a certain kind, then it is not clear why it should be restricted to EXTRAPOSITION-FROM-NP, and why the string-wise identity of the surface structures should be a significant condition for its applicability. That is, it is not clear why the configurational distinctions between (19a) and (19b), which exhibit the surface structures of the continuous and discontinuous readings of (18b) respectively, should not be sufficient to keep them apart.

(19a)



(19b)



3.1.1. With respect to the first objection, it should be pointed out that (D) is not in fact restricted to EXTRAPOSITION-FROM-NP, since it is applicable to structures involving PARTICLE-MOVEMENT. To see this, notice that the discontinuous reading is possible, with some awkwardness, in (20a), although it is not possible in (20c) (both sentences should be read without a pause before <u>off</u>).

(20a) ?John pushed the girl who was married to his brother off.
(20b) John pushed off the girl who had fallen.
(20c) John pushed the girl who had fallen off.

This observation does not, in itself, invalidate (D), as the latter could easily be generalized, perhaps by referring to movement transformations in general rather than to EXTRAPOSITION-FROM-NP. It does, however, create some real problems for (D), if it is taken in conjunction with my second objection.

3.1.2. Let us begin by noticing that the discontinuous reading is imperative in (20c) if we pause before the extraposed constituent off, but it is still impossible in (18b), even if we pause before who was pregnant. Why should pause make a difference between structures involving PARTICLE-MOVEMENT and EXTRAPOSITION-FROM-NP? The answer is that pause is impossible between a verb and its immediately following particle, while it is perfectly possible between a head noun and its relative clause modifier; in fact, it signals that the latter is non-restrictive. Given the possibility of choosing between an extraposed relative clause and a non-restrictive one, the perceptual strategy (E) forces the latter choice. We can see that differences in the surface parsing of sentences do prevent ambiguity, so long as they can be unambiguously signaled, and that the sufficiency of the string-wise identity condition in (18b) was merely a lucky accident.

It is not clear how (D) could be reformulated in a non-ad hoc was to account for the differences between (18b) and (20c), unless one would want to claim that sentences with and without pause are string-wise distinct. Such a way out would not, however, save (D), since the latter asserts that string-wise identity arises because of the application of EXTRAPOSITION-FROM-NP, and pause is not at all an automatic consequence of this transformation.

4.0. The next case that I wish to discuss concerns sentences like (21a), whose unacceptability was claimed by Lakoff to require a transderivational constraint.

(21a) *John and Bill entered the room, and hé took off his coat.
(21b) John and Mary entered the room, and hé took off his coat.
(21c) John told Bill that hé had won the sweepstakes.

The reason invoked by Lakoff was the ambiguity is a property of more than one derivation. I shall propose the perceptual principle (F) for handling (21a), and will show in section 4.4. below that there are cases which a transderivational constraint cannot handle.

(F) Sentences containing pronouns are incomprehensible, if the antecedent of a pronoun cannot be discovered by any means whatsoever, or if there are two or more equivalent candidates for the position of antecedent.

With respect to the means that may enable a hearer to discover the antecedent of a pronoun, I can see at least semantic, deep-configurational, surface configuration and extralinguistic factors.

4.1. The way in which semantic features effect disambiguation can be seen in (21b). Indeed, John, but not Mary, carries the feature [+MASCULINE], and is therefore the only possible antecedent of he. In (21a), however, John and Bill are equivalent candidates with respect to the semantic features in terms of which they must agree with he.

4.2. The part played by deep-structure configurations is demonstrated in (21c). Indeed, John and Bill appear in different underlying configurations, and are therefore non-equivalent candidates. Furthermore, as there is no principle which could force a choice between the two, both qualify as antecedents. In (21a), on the other hand, they are configurationally non-distinct in underlying structure, for John and Bill = Bill and John semantically.

4.3. With respect to surface structure, John and Bill are differently ordered. However, a rather curious feature of English is that, although surface order is in general important, it does not count for purposes of antecedent-recovery. I have heard that there are languages in which the question "Would you like tea or coffee?" can be answered "Yes," with the unambiguous meaning of "I would like coffee," as coffee is the last alternative offered. In such languages, the antecedent of he in (21a) might well be Bill only. It is clear that English is not such a language, for, if it were, there would be no need for items like the former, the latter, respectively, and (21c) would be unambiguous.

4.4.1. We shall now consider disambiguation through extralinguistic knowledge, which I claim cannot be handled formally. Indeed, I do not see how a transderivational constraint can be formulated to exclude (21a), but not (22).

(22) {John and Napoleon / Napoleon and John} entered the room, and he said he was going to make war on Russia.

The only way out that I can see is to require that whatever is asserted of a pronoun must be represented in the semantic characterization of its antecedent. This would, however, require the ascription to Napoleon of a feature like [+MADE WAR ON RUSSIA], which anyone would recognize as intolerably ad hoc. The correct generalization seems to be that any piece of information that the speaker and the hearer share can be used in antecedent-recovery.

4.4.2. I shall conclude this talk with a little story that supports the point just made even more strongly, and that cannot, as far as I know, be handled by any existing theory of pronominalization.

> [The dashing one-eyed Israeli Minister of Defense, general Moshe Dayan, is equally well-known in his country for his military exploits and for his appreciation of the fair sex.]
> Upon being asked by a foreign correspondent what she would do if a scandal similar to the Profumo case were to break out in Israel, the Prime Minister replied: "I would take out his other eye."

Although no one can have any doubts as to the referent of his, it cannot seriously be maintained that a constituent like Moshe Dayan is somehow represented in the underlying structure of the

correspondent's question, or that such a constituent can be recovered by purely formal interpretive rules.

Footnotes

[1]The paradigm in (17) does not, unfortunately, constitute a perfect example of a behavioral constraint on intermediate reconstructed stages, for the unacceptability of *one of NP is probably not due to perceptual factors. The paradigm does, however, suggest that such intermediate stages are important in decoding sentences, and I see no reason at this point for ruling out the possibility of sentences whose unacceptability is due solely to a perceptually complex intermediate representation.

[2]I have introduced the proviso in the absence of any clues to the contrary in (E), as it is important for my subsequent line of argumentation, but since it is applicable to all perceptual strategies, it should be formulated as a metacondition on perceptual strategies.

[3]Rosenbaum (1967) thought that distance measured along tree-branches is significant in English for recovering the antecedent of a deleted complement subject, but it was later shown by Postal (1968) that such a "minimal distance principle" cannot be correct since antecedent-uniqueness is only found in a subset of cases, where it appears to be determined by semantic factors. The problem is discussed extensively in my M.A. thesis.

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On Invited Inferences

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On Invited Inferences*

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1. Conditional Perfection. When confronted with sentences like

(1) If John leans out of that window any further, he'll fall.

students in elementary logic courses often propose that the examples are to be formalized with biconditionals rather than conditionals--that is, that (1) is to be formalized as the conjunction of

(2) $L \supset F$

and

(3) $\sim L \supset \sim F$

rather than (2) alone. The proposal is surely wrong: proposition (2) could be true and (3) false if John were not to lean out of the window any further but were to fall as the result of losing his grip or being hit by a gust of wind, etc.

What is right about the novice logician's proposal is that in a wide variety of circumstances, sentences having the logical form of (2) are interpreted, by many speakers, at least, as if they imply the truth of (3). For example, many speakers would take someone who says (4) to have committed himself to the truth of (6) as well as (5).

(4) If you mow the lawn, I'll give you five dollars.
(5) $M \supset G$
(6) $\sim M \supset \sim G$

Certainly, given our attitudes toward the exchange of money in our society, one would have some warrant for assuming that if someone says (4) he will act as if he intended both (5) and (6). Let us say that (4) promises (5) and invites the inference of, or suggests, (6).

In many cases, including those above, there is a quasi-regular association between the logical form of a sentence and the form of the inferences it invites. A general statement of the principle at work in the present case is

(7) A sentence of the form $X \supset Y$ invites an inference of the form $\sim X \supset \sim Y$.

Principle (7) asserts a connection between linguistic form and a tendency of the human mind--a tendency to 'perfect conditionals to biconditionals', in words suggested to us by Lauri Karttunen. This tendency is manifested in two classical logical fallacies, Affirming the Consequent (concluding X from $X \supset Y$ and Y) and Denying the Antecedent (concluding $\sim Y$ from $X \supset Y$ and $\sim X$), as well as in cases like (1) and (4). The great popularity of these fallacies and the ease with which principle (7) can confound the linguist investigating the semantics of conditional sentences indicate the strength of this tendency. Hereafter we refer to principle (7) as Conditional Perfection (CP).

2. Extent of CP. We have seen that CP is operative in the case of predictions (cf. (1) above) and in promises (cf. (4) above). It also applies in the case of threats, law-like statements, commands, and counterfactual conditionals. An instance of a conditional threat:

(8) If you disturb me tonight, I won't let you go to the movies tomorrow.

which suggests that good behavior will be rewarded. An instance of a law-like statement:

(9) If you heat iron in a fire, it turns red.

which suggests that cold iron is not red. An instance of a conditional command

(10) If you see a white panther, shout "Wasserstoff" three times.

which suggests silence in the absence of white panthers. An instance of a counterfactual conditional that is not superficially marked as such is

(11) If Chicago is in Indiana, I'm the Queen of Rumania.

which suggests (although it does not imply) that if Chicago turns out not to be in Indiana, then the speaker of (11) is indeed not the Queen of Rumania.

A striking case of CP involves marked counterfactual conditionals, as in

(12) If Andrew were here, Barbara would be happy.

It is natural to suppose that both the antecedent and consequent are presupposed to be false, that is that (12) presupposes that Andrew is not here and that Barbara is unhappy. But, as Karttunen observes in a squib to appear in Linguistic Inquiry, only the antecedent is presupposed false; the falsity of the consequent is merely suggested, not presupposed. What is so interesting about

this example is that it illustrates the degree to which CP can mislead the analyst.

3. Inclusive OR. The English or is in many contexts unspecified as to its inclusive or exclusive sense. In

(13) Give it to a friend or a colleague.

the possibility that the recipient be both a friend and a colleague is not barred, nor is it (in our opinion) specifically condoned. Quite often the favored interpretation is exclusive, as in

(14) Martin will play a blues number or dance a jig.

But in at least one context, the antecedent clause of a conditional or is normally understood by many speakers to be inclusive. Thus,

(15) If Martin plays a blues number or dances a jig, I'll imitate a porcupine.

suggests

(16) If Martin plays a blues number and dances a jig, I'll imitate a porcupine.

but does not imply it, as can be seen from the acceptability of

(17) If Martin plays a blues number or dances a jig, I'll imitate a porcupine, but if he does both, I won't do a thing.

The general principle (which is undoubtedly too specific and requires much further investigation) is of the form

(18) A sentence of the form (X OR Y) $\supset$ Z invites the inference (X AND Y) $\supset$ Z.

4. Inferred Causation. We mention here briefly a final class of invited inferences. Sentences which express a temporal sequence of situations, for example,

(19) After a large meal, we slept soundly.
(20) Having finished the manuscript, she fell into a swoon.
(21) Martha observed the children at play and smiled with pleasure.

invite the inference that the first situation is a cause of or reason for the second. It is clear that the relationship is one of suggestion, not implication; indeed, this principle of inference corresponds to the familiar fallacy Post Hoc Ergo Propter Hoc (just as CP has its related fallacies).

5. Prospectus. Beyond the tasks of collecting principles of invited inference, of making precise statements of them, and of classifying them--not unimportant tasks, inasmuch as invited inferences are a species of underbrush that must be cleared before investigations of semantics can thrive--there are several difficult and rather deep problems. To what extent are invited inferences regularly associated with the semantic content of a sentence? To what extent (if any) do invited inferences determine syntactic form?

The discussion of section 1 indicates that the association of inferences with semantic content can be highly regular, and this observation is supported by the fact that sentences which are conditional in meaning but not in form are subject to CP. Thus

(22) After a large meal, he sleeps soundly.

invites the inference that his sleep is troubled after moderate eating, presumably because (22) has a semantic representation close to that of

(23) If he has a large meal, then after it he sleeps soundly.

Similarly,

(24) Dogs that eat Opla are healthy.

suggests

(25) Dogs that are healthy eat Opla.

presumably because (24) has a semantic representation substantially like that of

(26) If a dog eats Opla, then it is healthy.

It seems, then, that what we have called 'invited inferences' constitute a special class of 'implicatures', in the terminology of the philosopher H. Paul Grice (in some very important but not yet published work), although they are clearly distinct from the 'conversational implicatures' which are his principal concern. Grice considers what interpretation will be placed upon an utterance in a particular context; he looks for general principles governing the effects that utterances have, principles associated with the nature of the speech act itself. CP is, in some sense, a principle governing the effects that utterances have--conditionals are understood to be perfected unless the hearer has reason to believe that the converse is false--but it is in no way that we can see derivable from considerations having to do with the nature of the speech act. In the case of Inferred Causation, it is at least possible to imagine that a Gricean axiom is the explanation of the principle of invited inference. But, we think, closer examination dashes these hopes. Consider, for example, (22) in light of

Grice's relevance principle ("Be relevant"), which might be supposed to provide some account of the fact that (22) suggests a causal connection between two events. But the sentence asserts a connection between two events--a temporal connection--so why should people tend to assume a further relevance? And even if the relevance principle can somehow be made to cover this case, why is the relevance assumed to be a matter of causation, and not some other sort of association between events? We must conclude that these facts do not lend themselves so easily to explanations of the Gricean sort.

As for the association of invited inferences with syntactic form, we have no evidence of direct relationship, although we would not rule out the possibility. Certainly, it seems to be the case that an invited inference can, historically, become part of semantic representation in the strict sense; thus, the development of the English conjunction since from a purely temporal word to a marker of causation can be interpreted as a change from a principle of invited inference associated with since (by virtue of its temporal meaning) to a piece of the semantic content of since.

Footnote

*We are indebted to Lauri Karttunen for many insightful comments.

Remarks on Directionality

Arnold M. Zwicky

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Remarks on Directionality

Arnold M. Zwicky

In several recent articles the issue of directionality in transformational grammar has been treated, rather unsatisfactorily to my mind. The question is this: Are the relationships among the various levels of grammatical description (semantic structure, deep structure, surface structure, phonetic structure) such that certain levels are descriptively prior to others? That is, is there an inherent "direction" to the relationship between two levels of description (say deep structure and surface structure)? Recent treatments suggest that the question is pointless, or that the answer is no. I maintain that this impression results entirely from the way previous discussions have been worded, and that the issues have yet to be approached properly.

The most important discussion, and one that deserves to be read with great care, is Noam Chomsky's in 'Deep Structure, Surface Structure, and Semantic Interpretation' (Chomsky, 1970):

> Whereas the standard theory supposes that a syntactic structure Σ is mapped onto the pair (P,S) (P a phonetic and S a semantic representation), the new theory supposes that S is mapped onto Σ, which is then mapped onto P as in the standard theory. Clearly, when the matter is formulated in this way, there is no empirical difference between the "syntactically based" standard theory and the "semantically based" alternative. The standard theory generates quadruples (P,s,d,S) (P a phonetic representation, s a surface structure, d a deep structure, S a semantic representation). It is meaningless to ask whether it does so by "first" generating d, then mapping it onto S (on one side) and onto s and then P (on the other); or whether it "first" generates S (selecting it, however one wishes, from the universal set of semantic representations), and then maps it onto d, then s, then P; or, for that matter, whether it "first" selects the pair (P,d), which is then mapped onto the pair (s,S); etc. At this level of discussion, all of these alternatives are equivalent ways of talking about the same theory. There is no general notion "direction of a mapping" or "order of steps of generation" to which one can appeal in attempting to differentiate the "syntactically-based" standard theory from the "semantically-based" alternative, or

> either from the "alternative view" which regards the pairing of surface and semantic interpretation as determined by the "independently selected" pairing of phonetic representation and deep structure, etc. Before one can seek to determine whether grammar is "syntactically-based" or "semantically-based" (or whether it is based on "independent choice" of paired phonetic representation and deep structure, etc.), one must first demonstrate that the alternatives are genuine and not merely variant ways of speaking in a loose and informal manner about the same system of grammar. This is not so easy or obvious a matter as is sometimes supposed in recent discussion.

Notice that the claim here is that 'at this level of discussion'--in the absence of any specific proposal for restricting the class of devices available for generating the quadruples (P,s,d,S) or for evaluating particular devices--no proposal to regard one or two of the types of representations as somehow more basic than the others can be empirically distinct from any other such proposal. That is, if the only empirical test of a device is its ability to generate a particular set, then clearly no two devices which generate the same set can be empirically distinct.

Consider the analogous problem in the field from which Chomsky's discussion springs, recursive function theory. The situation here is that there are many alternative ways of enumerating a given set. Take, for example, the set SQ of all pairs (A,B) where A is a whole number (1 or greater) in decimal notation and B is its square, also in decimal notation. Here is one way of enumerating the members of SQ:

a. (1,1) is in SQ
b. If (x,y) is in SQ, then (x+1, y+2x+1) is in SQ.

where 'x+1' represents the result of adding 1 to x, and 'y+2x+1' represents the result of doubling x, adding this to y, and then adding 1 to this sum. In terms of this device, neither a number nor its square is 'more basic' than the other; the device derives the two in the same step. The pair (4,16) is derived by the following sequence of steps (in which the substeps in the additions and doublings are suppressed): (1,1), (2,4), (3,9), (4,16).

The enumerating device above is not, of course, the one that leaps first to mind. Instead, one thinks naturally of a device which treats A as basic, in the sense that the digits of B are derived by operations performed on the digits of A. This is the standard multiplication algorithm, applied to calculating the product of A and A.

Still another possibility would be to treat B as basic, and derive A by a square-root algorithm, or by some method of successive approximation.

Now if the ability of a device to generate a set is the only empirical test of its adequacy, there is no sense in which any one of the methods for enumerating SQ is better than any one of the others. What then is the source of the feeling that applying the standard multiplication algorithm is somehow the best, or simplest, or most natural way of enumerating SQ? Besides custom, there are several possible sources--that within some definitional framework, the set of squares can be defined on the basis of the set of whole numbers and certain fundamental operations, but not vice versa, or that given certain computational devices, the standard algorithm involves the fewest steps or the least amount of 'scratch space'. In both cases, some claims about psychological reality are necessary if the explanation is not to be vacuous, for otherwise we would be free to select any definitional system (in some of which the set of squares would be fundamental) and any type of computational device (in some of which it would be simpler to take square roots than to multiply). The definitional systems and types of computational devices must be assumed to embody, in part at least, significant claims about mental organization.

There has been an interesting development within recursive function and formal language theory, moving from studies about which functions can be computed and which cannot, to studies in the complexity of computation (so called 'time and tape' questions)--from questions of generative power to questions of simplicity, essentially.[1] At the same time, workers in several fields have considered many alternative axiomatizations of logic and number theory; here the goal has been some sort of systematic elegance, rather than psychological reality, although logical priority and psychological priority will often run together.

The point of this discussion is that it is possible to speak of a sense of directionality in recursive function theory, though the appropriate sense has scarcely been examined. This sense of directionality is relative to a descriptive framework, and the suitability of the framework must ultimately be determined by considerations of psychological reality.

The situation in linguistics is precisely analogous. It is time to move from questions of generative power to questions of simplicity within a descriptive framework, and to inform this investigation with considerations of psychological reality. The remarks of Chomsky's quoted above were directed principally against efforts to decide the question of directionality on grounds of a priori plausibility (see, e.g. Chafe, 1970, chapter 7). In this cause his remarks are entirely appropriate. They are appropriate directed against any tendencies to see grammars as models of production or comprehension, a position taken by stratificational grammarians, among others. However, these remarks do not even approach the question of directionality proper--whether an adequate descriptive framework for linguistics imposes, in part or in whole, a direction on the relationships among phrase markers, and if so, what direction is imposed in particular cases. These issues are totally obscured by the tone of Chomsky's presentation, which suggests that there cannot <u>in principle</u> be any issue of directionality. Unfortunately, others have responded to the tone of Chomsky's article rather than

to its actual content. Thus, Lakoff (to appear) writes:

> the basic theory does not assume any notion of 'direction of mapping' from phonetics to semantics or semantics to phonetics. Some writers on transformational grammar have, however, used locutions that might mislead readers into believing that they assume some notion of directionality. For example, Chomsky (1970) remarks that '...properties of surface structure play a distinctive role in semantic interpretation'. However, as Chomsky points out a number of times in that work, the notion of directionality in a derivation is meaningless, so that Chomsky's locution must be taken as having the same significance as "Semantic representation plays a distinctive role in determining properties of surface structure" and nothing more. Both statements would have exactly as much significance as "Semantic representation and surface structure are related by a system of rules". The basic theory allows for a notion of transformational cycle in the sense of Aspects, so that a sequence of cyclical transformations applies "from the bottom up", first to the lowermost S's, then to the next highest, etc. We assume that the cyclical transformations start applying with P_k and finish applying (to the highest S) at P_l, where k is less than l. We will say in this case that the cycle applies 'upward toward the surface structure' (though, of course, we could just as well say that it applies 'downward toward the semantic representation', since directionality has no significance).

And Katz (to appear) argues, in essence, that there is no real issue between generative and interpretive semantics, because transformations and interpretive rules are merely inverses of each other; Chomsky's criticism of McCawley's (1968) treatment of respectively involves the same assumption, that to any transformation T there corresponds an inverse mapping (interpretive rule) T', and vice versa.

One of the difficulties in discussing the issue of directionality is that it has been associated with various other issues, at least the following: lexicalism vs. transformationalism in the case of derived nominals, uniform vs. multiple lexical insertion, syntactic vs. semantic selectional restrictions, surface structure interpretive rules vs. derivational constraints, a distinction in kind between semantic rules and syntactic rules vs. the lack of such a distinction, the existence of a level of structure (underlying structure) serving as the natural base for syntactic rules but distinct from semantic representation vs. the identity of deep structure and semantic representation, a distinction in kind between semantic representation and syntactic representations vs. unity of representational systems.[2] Although it is an historical fact that one

group of investigators has inclined to one constellation of positions, while another set has adopted the opposed positions, there is in general no logical necessity for these groupings; lexicalism does not imply interpretivist semantics, nor does a belief in non-uniform lexical substitution commit one to derivational constraints, for example. An assortment of mixed positions is possible, and in favorable circumstances one can even imagine remaining uncommitted to a position on one question while energetically arguing another. But it is, unfortunately, not easy to argue on one fundamental assumption without adopting some position on others.

Another difficulty attending upon discussions of directionality is that the broad linguistic theory within which these discussions take place views a grammar as a device for enumerating n-tuples of representations at n linguistic levels (as in the Chomsky quotation above), without assigning any sort of reality to intermediate representations or to the rules relating representations at various levels. But it is the burden of work by Peters, together with Ritchie, that so long as a grammar is judged by its output (the set of n-tuples it generates), in comparison with the output of alternative grammars within some broad descriptive framework, there will be innumerable grammars adequate for any purpose; to distinguish alternatives, we must have either a rather narrow descriptive framework, or additional tests of descriptions, or both (cf. Peters, 1970, and Peters and Ritchie, 1969). Undoubtedly, part of the difficulty here arises from the fact that we have become accustomed to thinking of grammars as formal objects constructed with the aid of a set of general notational conventions. Very few take seriously the notion that the set of possible rules is very narrowly determined, that one might even consider listing them, preparatory to or in conjunction with a search for explanations of the list's membership.

It is instructive to compare theory with practice in generative grammar. Most of the actual work on the syntax of specific languages has assumed that there is a directionality in description, and has been concerned with the form of rules, the ordering of rules, and the content of remote representations. By and large, directionality has been an issue only to the extent that analysts have needed to determine which direction was to be associated with a particular mapping. These matters have been especially clear in phonology, where no one is inclined to be suspicious of the fact that the mapping (s,P) of systematic phonological representations to systematic phonetic representations is partitioned into a set of mappings called rules, and where the directionality of particular rules is uncontroversial. If phonology is ultimately to have any content, it will do so by virtue of the reality assigned to phonological representations and rules in themselves. The corresponding claim for syntactic rules has scarcely been defended--but see Bach ms. (1970) for an interesting treatment of interrogatives along these lines, complete with an assertion of universality for the rules he discusses.

To sum up: questions of directionality cannot be raised except in a reasonably narrow descriptive framework. Discussions at a high level (i.e. within certain broad 'theories of grammar') are

entirely pointless, because they cannot possibly decide any issue, just as discussion at a high level (i.e. within the broad theory of recursive functions) cannot possibly decide any issue having to do with directionality in cases like that of the set SQ mentioned above. Within certain frameworks the issue of directionality will be decidable. For example, in various restricted versions of the Aspects model, lacking both derivational constraints and surface structure interpretation rules, many sets of pairs (t_1, t_2) of syntactic representations t_1 and t_2 will have a clear direction associated with them, in the sense that the required mapping will be definable in one direction only; the infinite processes, or unbounded movements, treated by Ross (1967) will all be cases of this sort. In such frameworks, it may even be possible to define an overall directionality in syntax; what would be required is proof of directionality for particular rules, plus arguments for rule ordering, plus arguments for the absence of loops in ordering (other than those permitted by cyclical principles). However, these Aspects-based frameworks are known to be deficient in many ways, and very little effort has been spent on constraining the richer theories now under discussion. Hence, there is at the moment no credible framework available in which questions of directionality can be profitably raised. I look forward to theories embodying very strong substantive universals, theories in which these questions can be treated.

Footnotes

[1]Compare the two chapters devoted to these topics in Hopcroft and Ullman (1969), already a standard text, with an earlier classic, Davis (1958), which does not even mention them. Even Minsky (1967) gives no treatment.

[2]There exists no careful and uncontentious treatment of these differences in fundamental assumptions. Postal (1970, Section V) is perhaps the best. Despite its title, Katz (1970) is not a balanced discussion of the two factions; instead, it is as much a polemic as Lakoff (to appear), and in addition is a prime example of the way in which many separate issues can be confused.

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Evidence

Barry Nobel

Evidence

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The purpose of this paper is to explain the syntactic properties of a small class of verbs: think, believe, assume, suppose, anticipate.

1. The transformation Neg Raising, also called Neg Hopping or Neg Transportation, is usually invoked in order to explain the synonymy of sentences such as the following:

(1) I think that he didn't leave.
(2) =I don't think that he left.

Since (1) and (2) are paraphrases, it is assumed that they share identical deep structures. The difference in the surface structures of the two is that (2) has undergone the transformation, while (1) has not. Neg Raising seems to be sensitive to Ross' Complex Noun Phrase Constraint, since all factive verbs block it (Kiparsky and Kiparsky, to appear).

(3) I regret that he didn't leave.
(4) ≠I don't regret that he left.

However, not all non-factive verbs may undergo Neg Raising.

(5) I charge that Nixon doesn't want to end the war.
(6) ≠I don't charge that Nixon wants to end the war.

There are only a very few verbs that do permit Neg Raising, and these comprise the set which I will call evidentials.

2. Parenthetical constructions are tags of the type I think added to any declarative sentence.

(7) He left, I think.

Factive verbs cannot appear in parenthetical constructions.

(8) *He left, I regretted.

But non-factive verbs can, only when accompanied by pause plus secondary stress on the parenthetical verb.

(9) "He left," I { maintained / charged / asserted } .

In contrast, evidential verbs in parenthetical constructions need no such suprasegmental marking.

(10) He left, I { thought / believed / supposed } .[1]

3. Agentivity of evidential verbs is ambiguous when Neg Raising does not apply.[2]

(11) John supposed that he didn't leave.

Sentence (11) can be understood as John actively conjuring the thought, or as the thought creeping in on John. However, the paraphrase of (11) with Neg Raising can only be understood non-agentively.

(12) John didn't suppose that he left.

This becomes clear in pro-agentive contexts, such as certain adverbs.

(13) John stupidly supposed that he didn't leave.
(14)≠?John didn't stupidly suppose that he left.

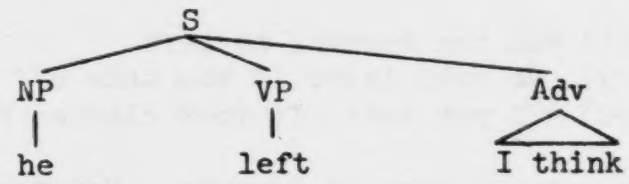
Placing evidentials into progressives also forces an agentive interpretation of their surface subjects.

(15) John was supposing that he didn't leave.
(16) ≠John wasn't supposing that he left.

These examples show that subjects of evidentials may be agents or non-agents when Neg Raising does not apply, but only non-agents when Neg Raising does apply. Thus examples (13) and (15), in which the subjects must be agents, cannot be paraphrased by examples (14) and (16), with Neg Raising, because in order for them to be paraphrases, the subjects of (13) and (15) cannot be agents. In G. Lee (1970) it is argued that certain non-agent subjects are raised by a transformation from by-clauses (adverbs). Since, as we have seen, some subjects of evidential verbs cannot be agents, it is not unreasonable to suppose that such subjects arise by transformation from a lower clause.

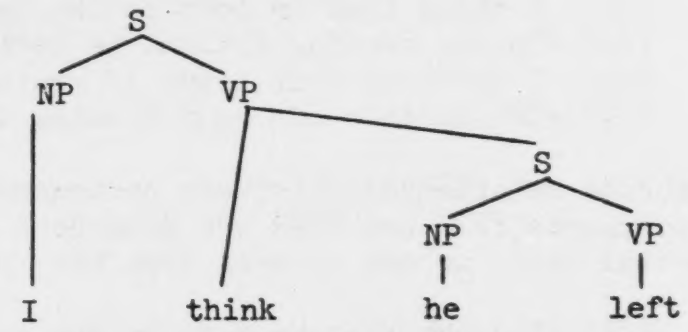
4. The relations between Neg Raising, parenthetical constructions, and agentivity can be explained by assuming that some evidential verbs come from underlying adverbs. For example, the underlying structure of I think he left would be:

Type I

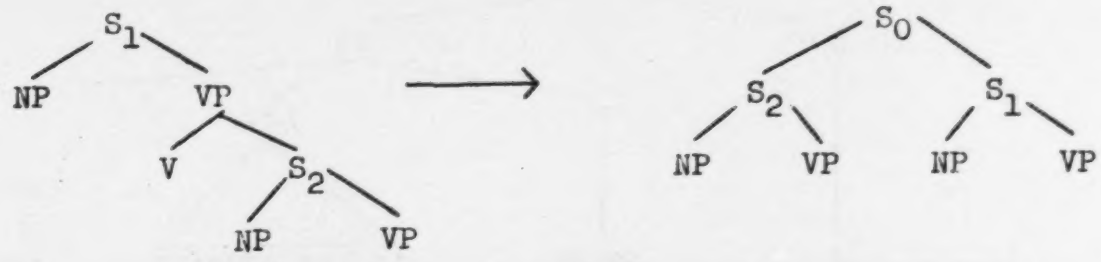


An optional transformation would create a matrix sentence out of the adverb. This is Adverb Preposing.

Type II



When Adverb Preposing does not apply, a parenthetical is left. Evidential verbs with agentive subjects arise from an underlying structure of Type II directly. Thus all of the examples (13) to (16) must have an underlying structure of Type II, and they are not paraphrases because the element not comes from the lower clause in (13) and (15), but from the higher clause in (14) and (16). Non-evidential parentheticals then come from underlying structures of Type II by a transformation which includes a mechanism for stressing the parenthetical verb and inserting pause. This transformation is Ross' Sentence Lifting, or Slifting:



In the output of Slifting, the two sentences are independent of each other structurally, while in underlying structure Type I above, the I think is not independent of the preceding sentence, but dominated by it. These structures accurately reflect the observation that pause and secondary stress separate non-evidential and agentive evidential parentheticals from the preceding sentences, but pause and secondary stress do not separate non-agentive evidential parentheticals from preceding sentences (Ross, to appear).

5. In G. Lakoff (1970), a rule of Adverb Preposing is given which is similar to the rule described above. The motivation for Lakoff's rule is that if-clauses may be optionally moved to the front of their clauses the same as certain adverbs.

(17) He left in the evening.

(18) =In the evening he left.
(19) He will leave if you take off your clothes.
(20) =If you take off your clothes he will leave.

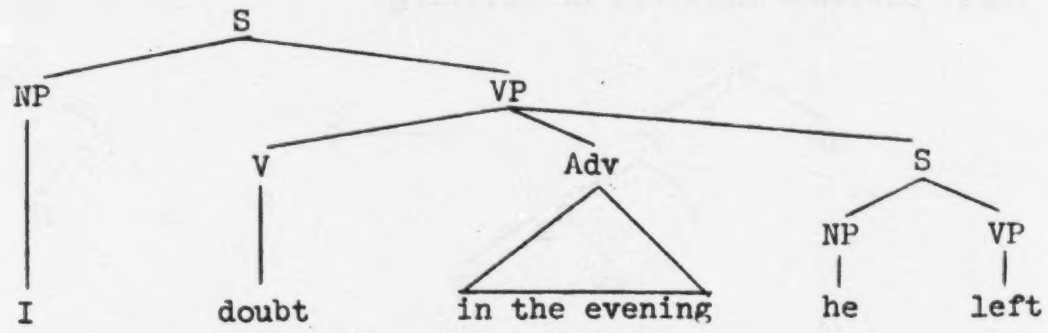
Thus, if-clauses are seen as adverbs. However, it seems that some verbs permit Adverb Preposing to a higher clause than the one from which it arises. These verbs are the evidentials.

(21) I think that he left in the evening.
(22) =In the evening I think he left.
(23) I think he will leave if you take off your clothes.
(24) =If you take off your clothes I think he will leave.

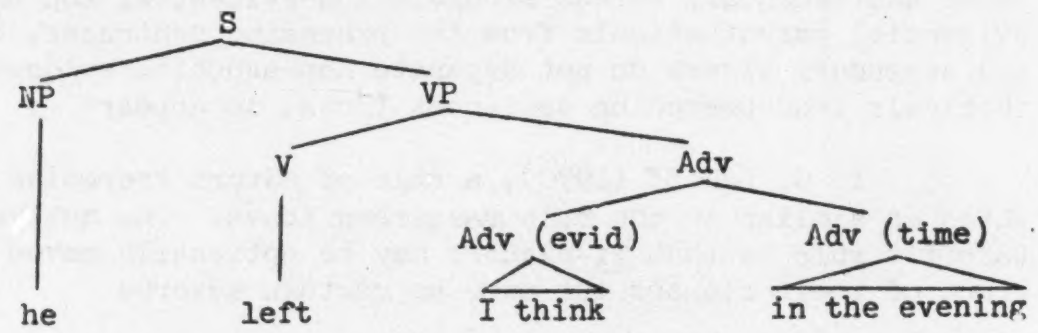
The paraphrase relationships between sentences (21) and (22) and between sentences (23) and (24) are dependent on the occurrence of an evidential verb, as can be seen from the following examples:

(25) I doubt that he left in the evening.
(26) ≠In the evening I doubt that he left.
(27) I doubt he will leave if you take off your clothes.
(28) ≠If you take off your clothes I doubt he will leave.

It is clear from these examples that if the evidentials are considered as derived from adverbs, then it can be stated definitely that Adverb Preposing can move an adverb only to the beginning of its own clause. Sentence (26) must then have an underlying structure like:



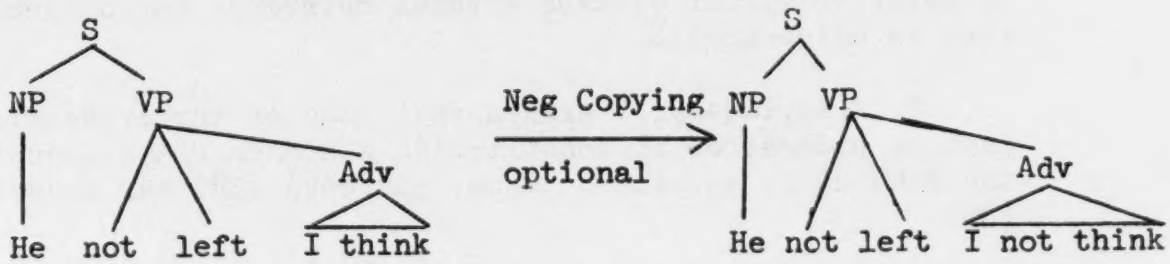
Sentences (21), (22), and In the evening he left, I think can all be derived from the following underlying structure, depending on which of the three adverbs is preposed.

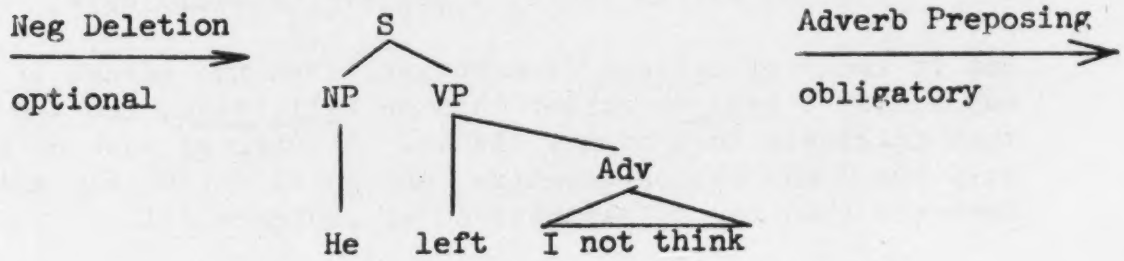


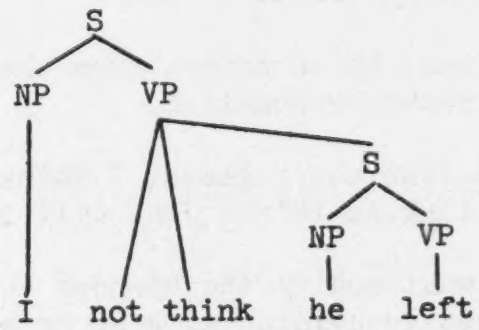
6. Klima (1964:267) gives a rule of Neg Incorporation into Adverbs which works optionally for cases in which not precedes the affected adverb. This rule plus the Adverb Preposing rule suffice to explain all cases of apparent "neg raising," plus the occurrence of certain grammatical double negatives.

(29) He didn't leave, I think.
(30) =He didn't leave, I don't think.
(31) *He left, I don't think.

The synonymy of sentences (29) and (30) suggests that the Neg Incorporation transformation is actually a two-fold process. First, neg is copied into the adverb, then the original neg is erased. But if the original neg is erased, then Adverb Preposing must apply in order to avoid sentences such as (31).







These relations are similar to those which may occur with unit adverbs such as ever.

(32) He didn't leave ever.
(33) =He didn't leave never.
(34) *He left never.
(35) =Never did he leave.

This analysis is the exact opposite of that proposed by Ross (to appear) in which the neg originates in the lower clause, and is then copied into the higher clause. Slifting follows, and finally Not Deletion. The faults of this analysis are, first, that it is not sensitive to agentivity, and, second, that it presupposes that (36) and (37) are paraphrases, which they are not.

(36) I think Max isn't here.
(37) I don't think Max isn't here.

Since Slifting does not apply in (37), it might be argued that obligatory Not Deletion follows. However, then the Not Deletion rule must be sensitive to whether or not (37) represents an instance of Not Copying, as opposed to true double negation. In addition, the analysis by evidential adverbs enables one to restrict Slifting to positive higher clauses without reference to whether or not the verb is evidential.[3]

7. Previously, I argued that some of the evidential verbs must be understood as constituting a higher clause, just in case the subject is agentive. Thus, sentence (38) may underlie sentence (39).

(38) He will leave if he wants, I believe.
(39) =If he wants, I believe he will leave.

But if the I of believe is agentive, then the adverb if he wants may modify I believe rather than he will leave, and the I believe must originate in a higher clause. In strings such as sentence (40), only the I may be non-agentive, and he is definitely agentive. Sentence (40) may be paraphrased by sentence (41).

(40) I think that he thinks John will leave.
(41) =He thinks John will leave, I think.

But the parenthetical in (41) must be an adverb from the clause headed by he thinks, as can be shown by negation.

(42) He thinks that John won't leave, I think.
(43) =I don't think that he thinks John will leave.

Therefore, evidential adverbs must modify the highest verb in the sentence, whether it is an agentive evidential verb or not.

8. From the above discussion, it is apparent that parenthetical evidentials share many of the properties of adverbs. First, they satisfy, along with true adverbs, the structural analyses of two of the rules which we have been discussing: Neg Incorporation into Adverbs and Adverb Preposing. Second, they follow the constraint that limits adverbs to only one adverb of any particular type per deep clause. Thus sentences with more than the manner adverb, for instance, are ungrammatical.

(44) *He gracefully played the piano beautifully.

Evidential parentheticals also obey the constraint.

(45) He left, I suppose I believe.

In (45), only the I believe can be an evidential adverb, since I suppose is unambiguously agentive and is preceded by pause.

However, evidential parentheticals, along with the if-clauses considered before, do not modify only the main verb of the sentence as do true adverbs, but the entire sentence. Thus, adverbs such as in the evening modify only the verb came in sentence (46). But I think in sentence (47) modifies not only came, but the subject of the sentence as well.

(46) He came in the evening.
(47) He came I think.

If this difference is to be reflected in theory, then evidential adverbs must be viewed as arising from some higher node. Fillmore (1968) provides an appropriate one, when he analyzes sentences into modalities plus propositions: S → M + P. Propositions are expanded into verbs with their appropriate cases, while the modalities carry information which relates to the entire sentence. An example of this type of information is tense, which must later be attached to the verb by transformation. Since evidentials also relate information about entire sentences, they too may be regarded as instances of modality. The existence of an evidential mood in languages such as Latvian, which use them for relating events whose occurrence is questioned by the speaker, shows the validity of this sort of analysis. In Latvian, this instance of M is realized as an inserted verb infinitive /æsuat/ followed by a past active participle.[4] In English, this M is realized as an adverbial element.[5]

Footnotes

[1]The verb understand is an exception, since it can occur parenthetically without stress and pause, yet does not participate in Neg Raising. I cannot rationalize the discrepancy.

[2]John Kimball of the University of California at Santa Cruz (ms 1970) also noticed a semantic distinction between instances of the verb believe with and without Neg Raising. His reportive and expressive categories correspond roughly to the agentive and non-agentive distinction that I make use of. Although his structural solution to the problem of Neg Raising is different from mine, his discussion of the semantic issues is more clear and insightful. Our general conclusions are practically identical.

[3]Ross notes as one of the difficulties of his analysis that the restrictions on Not-Hopping and Shifting are identical but must be stated twice--once for each transformation.

[4]Valdis J. Zeps of the University of Wisconsin mentioned this fact about Latvian during his lectures at the 1970 Linguistic Institute held at Ohio State University.

[5]I wish to express my appreciation to Gregory Lee and James Heringer, who offered many helpful suggestions and examples during the initial phase of this work, and to Arnold Zwicky, who helped put this paper into its final form.

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How Come and What For

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How Come and What For

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0. Introduction. In this note we make a few elementary observations about the syntax and semantics of the English interrogative phrases how come and what for, in such sentences as

(1) How come there is a mark on this page?
(2) What is there a mark on this page for?
(3) How come she just screamed?
(4) What did she just scream for?[1]

We argue that, semantically, these idiomatic phrases together cover the domain of the simple interrogative why. How come questions cause, what for purpose. Syntactically, sentence initial how come is an adverbial associated with the main clause of the sentence, while sentence initial what of what...for may be associated with any clause.[2]

1. Semantics. Aside from their colloquial flavor, both how come and what for are reason adverbials, like standard why. Thus, to

(5) There is a mark on this page for some reason.

or

(6) There is some reason for there being a mark on this page.

there correspond (1), (2), and

(7) Why is there a mark on this page?

Likewise, to

(8) She just screamed for some reason.

or

(9) There is some reason for her just having screamed.

there correspond (3), (4), and

(10) Why did she just scream?

Many speakers of English perceive, on reflection, a meaning distinction between (1) and (2), and feel that (7) expresses both of

these meanings. The declarative sentence in (5) or (6) is similarly ambiguous; the noun reason may refer to an external explanation, that is, a cause, or to an intention on the part of some agent, that is, an end or purpose. In the same way, a sentence with because, beginning

(11) There is a mark on this page because...

may describe either cause or purpose, so that

(12) There is a mark on this page because the dye in the binding ran.

is an answer to (7) or (1), but not (2), while

(13) There is a mark on this page because I wanted you to be sure to read it.

is a natural answer to (7) or (2) (although it is also a possible answer to (1), as we shall see below).

We are than claiming that what for is an adverbial like cleverly, requiring that the sentence with which it is associated contain an Agent, in Fillmore's (1968a) sense, hence that the predicate of this sentence describe a situation which can be controlled by a human being. These restrictions can be seen in the difference between

(14) How come George is tall?
(15) How come you feel cold?

which are perfectly acceptable (heredity and a draft, respectively, might be the explanations) and the relatively strange

(16) ?What is George tall for?
(17) ?What do you feel cold for?

which are odd because one's height and sensations of temperature are not controllable matters; to interpret (16) or (17) one must suppose that George has somehow managed to manipulate his height or adjust his perception of warmth independent of his surroundings. There is a distinction even in the case of controllable situations, depending upon whether or not the sentence can be interpreted as implicating an Agent. Fillmore (1968b) has pointed out that sentences like

(18) Ernest was hit with a bat.

and

(19) Ernest was hit by a bat.

differ in that (18) has an underlying unspecified Agent, which is deleted by transformation, whereas (19) has no Agent in its deeper structure. Consequently, it should be the case that (18), but not (19), can be questioned comfortably with what for, and this seems to be true:

(20) What was Ernest hit with a bat for?
(21) ?What was Ernest hit by a bat for?

Informants confronted with (21) tend to say that the bat in question is a nocturnal flying mammal with aggressive intentions towards Ernest, if they accept the sentence at all.

In the same vein, many speakers of English distinguish the verbs fail (to) and refrain (from) by requiring only the latter to occur with an Agent (roughly, one refrains by exerting some effort, but may fail by omission as easily as by commission). Consequently, only refrain (from) should occur comfortably with what for, and this appears to be the case:

(22) What did Elizabeth refrain from answering for?
(23) ?What did Elizabeth fail to answer for?

The way in which an Agent is implicated in what for sentences may be indirect, mediated by an element like let or get that does not appear on the surface. Thus,

(24) What is the door open for?

is grammatical, despite the absence of an Agent in any remote structures for

(25) The door is open.

The interpretation of (24) is essentially that of

(26) For what purpose has someone

$$\left\{\begin{array}{l}\text{let the door stay open}\\ \text{gotten the door to be open}\end{array}\right\} \ ?$$

That is, the speaker of (24) supposes that someone is responsible for the door's being open, either by refraining from altering its state or by bringing it to that state, and he supposes that the responsible person has some purpose in doing this; the speaker of (24) is inquiring after this purpose. We assume that an element like let/get is explicit in a remote structure for (24) and is deleted transformationally, just as such an element is deleted in the derivation of sentences like

(27) I tried to be arrested.
(28) I condescended to be arrested.

treated by Perlmutter (1968, section 2.1.1).

The semantic distinction between how come and what for is obscured somewhat by the fact that it is very difficult to concoct environments in which what for is acceptable, but not how come.

The source of this difficulty is easy to see--human intention can usually be construed as an explanation for some state of affairs. My intention that a mark on a page should catch your attention serves to explain the appearance of a mark on the page, for example. But there are some contexts which require an intentive interpretation. One of these is the stressed uncontracted negative of

(29) Why did he <u>not</u> leave?

which must be interpreted as

(30) That was his purpose in not leaving?

what is, as

(31) What did he <u>not</u> leave for?

Causal <u>how come</u> is quite odd here:

(32) ?How come he did <u>not</u> leave?[3]

Another pure intentive context is in responses to sentences specifically communicating intentions, such as

(33) Do you want me to read you this letter?
(34) Shall I read you this letter?
(35) Would you like me to read you this letter?
(36) How about my reading this letter to you?
(37) Let me read you this letter.

To such sentences, the response <u>What for</u>? is perfectly natural, meaning 'Why should you?', that is, 'What purpose could you have in doing it?'. The response <u>How come</u>? is definitely odd; further examples in conversations:

(38) Q: Why don't I read you this letter?
A: What for? / *How come?
(39) Q: Wouldn't you like to have me read you this letter?
A: What for? / *How come?
(40) Q: Will you let me read you this letter?
A: What for? / *How come?

and within the sentence:

(41) I promise you to read you the letter, although you might wonder $\left\{\begin{array}{l}\text{what for}\\ \text{?how come}\end{array}\right\}$.

(42) I insist that you give me the diamonds, even if you can't imagine $\left\{\begin{array}{l}\text{what for}\\ \text{?how come}\end{array}\right\}$.[4]

We therefore set up a division of REASON into CAUSE/PURPOSE, manifested in questions as how come/what for, neutralized to why (in questions) or because (elsewhere). CAUSE is a relation between one state of affairs and another, PURPOSE between the actions of an Agent and an (intended) state of affairs. In both cases, the first state of affairs temporally precedes the second and is in some way an explanation of it.

It is a commonplace of the philosophy of science that explanations are the answers to the question why? Yet the taxonomies of explanation constructed by philosophers are of little linguistic interest; as is so often the case, the purposes of philosophers and linguists diverge at an early point. Nagel (1961, chapter 2), for instance, sees four principal classes of explanations--deductive, probabilistic, functional or teleological, and genetic. However useful these distinctions might be in elucidating relationships between states of affairs, they do not appear to correspond to linguistic categories.

Linguistically, several general observations of interest can now be made. The first is that the English phrases how come and what for divide up the semantic domain of why without residue; and that although in certain environments it is difficult to disentangle the two phrases, they are semantically quite distinct. This suggests that the opposition CAUSE/PURPOSE is a natural one.

A deeper observation concerns the internal relationships of CAUSE and PURPOSE, both involving two states of affairs, but only the latter implicating an Agent. This is the relationship between the principal senses of the "connection-of-ideas" verbs suggest, mean, imply, prove, demonstrate, and show; each of these verbs has a pure relational sense, in

(43) Jeanne's eagerness to please { suggests / means / implies / proves / demonstrates / shows } that we should use her.

as well as an intention sense, implicating an Agent, in

(44) He { suggested / meant / implied / proved / demonstrated / showed } that we should use Jeanne.

The two senses of suggest et al. are somehow related in the same way as CAUSE is related to PURPOSE.

2. Syntax. We consider first the case of how come. In examples like

(45) How come Herman said Gwen ate the goldfish?

the adverbial how come can be associated only with the main clause (verb said), not with the complement clause (verb ate). The adverbials why and what for, in contrast, are ambiguous with respect to their clause of origin:

(46) Why did Herman say Gwen ate the goldfish?
(47) What did Herman say Gwen ate the goldfish for?

may have either of two remote structures, roughly of the following shapes (disregarding the interrogative component in their meaning):

(48) [for some reason Herman said [Gwen ate the goldfish]]
(49) [Herman said [for some reason Gwen ate the goldfish]]

Now neither how come nor what for is restricted to main clauses, for both may initiate questions at any depth of embedding:

(50) Margaret wondered how come Herbert grew piranhas.
(51) I realized that Margaret knew how come Herbert grew piranhas.
(52) You must have seen what she kept that rope for.
(53) I announced that you must have asked what she kept that rope for.

The restriction on how come is therefore that it cannot be moved out of its clause.

Why should how come, but not the very similar interrogatives what for and why, fail to undergo movement out of its clause? One possible explanation, suggested by the morphological composition of how come, is that how come represents a level of structure in itself, mnemonically how has it come about (which also approximates the semantic content required). If this is the sort of structure assigned to how come, then (45) is derived from something on the order of

(54) How did it come about that Herman said Gwen ate the goldfish?

and the failure of (45) to have an interpretation corresponding to the declarative

(55) Herman said how it came about that Gwen ate the goldfish.

results from the fact that the only question derivable from the structure of (55) is

(56) How did Herman say it came about that Gwen ate the goldfish?

That is, with a structure like that of (55) as a basis, standard rules will yield only (56), and not (54), which must be assumed to have a distinct structure of its own.

The derivation of (45) from a structure like the one associated with (54) is further supported by a striking peculiarity of how come questions, their failure to condition subject-verb inversion. Compare

(57) How come she has read the book?

with normal wh-questions, for example

(58) What has she read the book for?
(59) Why has she read the book?
(60) How has she read the book?
(61) How far has she read the book?

all of which exhibit inverted word order. The opposite orders are impossible:

(62) *How come has she read the book?
(63) *What she has read the book for?

The components of she has read the book in (57) have the order of an embedded clause (interrogative or otherwise), not of an interrogative main clause. This fact is accounted for if (57) is derived from a structure like that of

(64) How has it come about that she has read the book?

by means of a reduction of the main clause to how come, with concomitant elimination of the tense-bearing element in the main clause. Many speakers have, in fact, a clearly bisentential variant of (57):

(65) How come that she has read the book?

with the complementizer that.

What for exhibits an entirely different set of syntactic peculiarities, many of which we have already illustrated. The obvious sourse of what for is the full adverbial for what purpose, with aberrant deletion of the head noun purpose and the expected fronting of the wh-word what. A more complex analysis is suggested by some observations of Lees', which we will attempt to dismiss here.

Lees (1960, 38), in a brief consideration of the conditions governing fronting of wh-phrases, remarks that "when the nominal is an internal constituent of an adverbial prepositional phrase, it may not be pulled out... Thus, from: John sent the package to Chicago. there is no: *What did John send the package to?, but only: Where did John send the package?; or similarly, from: He left it at the office. there is no: *What did he leave it at?, but only: Where did he leave it?" Taking Lees' constraint at face value, we should

expect that what would not be movable out of the adverbial prepositional phrase for what (purpose), so that wh-fronting would have to move the entire phrase, to yield

(66) for what (purpose) did you do that

from

(67) you did that for what (purpose).

As a result, a special rule would be required to extrapose the for, if

(68) What did you do that for?

is to be the product of the derivation. Lees' constraint forces a double movement analysis, it seems. We now argue that the double movement analysis involves severe technical difficulties, and anyway, Lees' constraint does not need separate statement, because its effect is achieved by a careful statement of the wh-fronting rule.

First, the technical difficulties with the double movement analysis. The problem here is that the second movement rule is enormously hard to state, since its effect must be to return for to its original position, which is not necessarily the right end of the S headed by what for.

Some adverbials may follow for:

(69) What did Charles say Helen did that for last night?

(in which what for and last night are associated with did that, not with say)

(70) What does Charles want Helen to do that for this morning?

These may even be complex (although many speakers find such sentences less than fully acceptable):

(71) What did Charles say Helen did that for right after she was told not to?

(72) What does Charles want Helen to do that for before she gets the things she wants?

To move these instances of for to their positions in (71) and (72) would appear to require nothing less than an indication of where the adverbials were positioned before the operation of wh-fronting. The for-return rule thus not only lacks independent motivation, but also must have the effect of exactly undoing the wh-fronting rule.

What, then, supports Lees' formulation of the constraint on wh-fronting? There are numerous types of counterexamples to his formulation--cases of wh-words moved out of adverbial prepositional phrases: for instance,

(73) What did he leave the package on?

related to a structure like that of

(74) He left the package on the andiron.

and

(75) Who did he walk between?

related to a structure like that of

(76) He walked between Aaron and Zachariah.

An explanation for these facts is provided in a well-supported analysis suggested by Klima (1964), who proposed that the interrogative wh-words be derived from constituents of the same type as some, any, no, and every, and their compounds (something, someone, somehow, someplace, sometime, etc.). In this analysis, the nominal what is related to something, who to someone or some people, where to someplace, and so on. The oddness of Lees' examples,

(77) *What did John send the package to?
(78) *What did he leave it at?

corresponds to the oddness of

(79) *John sent the package to something.
(80) *He left it at something.

and the acceptability of (73) and (75) corresponds to the acceptability of

(81) He left the package on something.
(82) He walked between some people.

Consequently, there is no reason to suppose that a general constraint bars the removal of what (purpose) from its prepositional phrase, for what (purpose), and the double movement treatment is not required.

We now turn to the ordering of wh-fronting and the rule that deletes the element purpose. The paradigm is as follows:

(83) For what purpose did he eat mudpies?
(84) ?What purpose did he eat mudpies for?
(85) *For what did he eat mudpies?
(86) What did he eat mudpies for?

The obvious analysis is to suppose that wh-fronting applies first, that purpose is deleted when it occurs following a sentence-initial what, and that the deletion is optional for some speakers. In this analysis, (85) illustrates a deletion in the wrong environment, and (84) failure to delete (for those who allow it).

Finally, we note that although the parts of what for are discontinuous in the examples that come first to mind, there are cases in which they occur together:

(87) My brother told me he wanted popsicle sticks, but I couldn't understand what for.

(88) The dean had vaseline on his face, and I was the only person who knew what for.

The rule in operation here is a very interesting deletion rule, called Sluicing by Ross (1969), who argues that the deletion follows wh-frontings, so that in examples like (87) and (88) Sluicing has had the effect of reuniting the parts of what for, through intermediate stages like

(89) My brother told me he wanted popsicle sticks, but I couldn't understand what he wanted popsicle sticks for.

(90) The dean had vaseline on his face, and I was the only person who knew what the dean had vaseline on his face for.

Under certain conditions, Sluicing deletes all the material after an initial wh-word in an embedded question, up to a final preposition (e.g. the for of what for) or certain other constituents.[5]

(91) He murdered his wife, and everyone is asking why not his mother-in-law too.

(92) He tells me he likes to travel, but I can't imagine where without a Eurailpass.

Sluicing apparently also accounts for various short interrogative responses in conversations (since the constraints on these are the same as the constraints on Sluicing within the sentence):

(93) A: Dick murdered his wife.

B: { Why? / How come? / What for? / Why not his mother-in-law too? }

(94) A: Dick murdered his wife with a pitchfork this morning.

B: { Why with a pitchfork? / How come today of all days? }

Footnotes

[1]This sentence illustrates an ambiguity between an interpretation of what...for as an adverbial of reason and an interpretation in which what represents an object NP. Only on the latter reading can (4) be paraphrased as

(i) What was it that she just screamed for?

Just so

(ii) What did you go to the grocery for?

has both a reason interpretation and a reading paraphrased by

(iii) What did you go to the grocery to get?

or

(iv) What was it you went to the grocery for?

Henceforth we shall ignore the non-reason interpretation of what... for questions.

[2]Subject, of course, to familiar constraints on movement rules, as treated by Ross (1967).

[3]How come he didn't leave? is entirely acceptable, but does not require an interpretation in which the subject's failure to leave is intentional.

[4]The specific restriction illustrated in (38)-(42) is one barring certain cause adverbials as modifiers of performative verbs. This restriction on because has been discussed by Davison (1970). Compare the somewhat odd

(i) ?Because you're a nice guy, I promise you to read you the letter.

with (ii) Since you're a nice guy, I promise you to read you the letter.

[5]A constituent must not interrupt what for, however. Compare (91) with

(i) *He murdered his wife, and everyone is asking what with a pitchfork for?

But this is a general fact about split prepositional phrases is sluiced sentences; compare (92) with

(ii) He tells me he likes to travel, but I can't imagine where to.

(iii) *He tells me he likes to travel, but I can't imagine where without a Eurailpass to.

The result of Sluicing is less unsatisfactory when the adverbial follows what for or where to:

(iv) ?I realize he murdered his wife, but I can't imagine what for with a pitchfork.

(v) ?He has been going places all afternoon, but no one knows where to at two o'clock.

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In a Manner of Speaking*

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In a Manner of Speaking

Arnold M. Zwicky

To what extent is it possible to predict certain properties of words (syntactic, semantic, or phonological) given others? Insofar as there are such dependencies among properties, what general principles explain them? Put another way: What sorts of word classes are there, and why these and not others? In what follows I consider a class of English words and enumerate their common properties, by way of asking why this rather long list of properties should happen to characterize a large and open word class in English.

The class in question is exemplified by

(1) shout, scream, yell, holler, bellow, whisper, shriek, wail, lisp, hoot, growl, grunt, mumble, moan, howl, mutter, whine

all of which are verbs referring to intended acts of communication by speech and describing physical characteristics of the speech act. Hence the label manner-of-speaking verbs is appropriate.

I take up first those properties of manner-of-speaking verbs which, it seems to me, are most likely to be predictable from their semantic characteristics; these are properties A through F below.

A. A manner-of-speaking verb is an activity verb (Lakoff 1966, Lee 1969:41-45); it occurs in the progressive, in the imperative, as a complement of force, and in the frame What John did was _____ (among other tests):

(2) He was shouting obscenities.
(3) Yell to George about the new quota.
(4) I forced them to whisper that they were tired.
(5) What John did was lisp French to Mary.

B. The referent of the subject of a manner-of-speaking verb is typically human.

(6) { My father / *My desk } howled for me to pick up the chair.

C. A manner-of-speaking verb may have an indirect object, marked by to, and the referent of this object is typically human.

(7) Scream "Up the Queen" (to the first person who passes).
(8) *She will howl "O my stars and garters" to the essence of friendship.

D. A manner-of-speaking verb may have a direct object, which is either a nominal referring to the product of a speech act, a desentential complement (that-clause, indirect question, or infinitival construction) or a direct quotation.

(9) Hoffman will probably mutter { a foul oath / two or three words / something unintelligible }.

(10) Martin shrieked { that there were cockroaches in the caviar / how we could free him from the trap / for Pierre to fetch a nurse }.

(11) Regrettably, someone mumbled, "I suspect poison."

E. Desentential complements of a manner-of-speaking verb are construed nonfactively (Kiparsky and Kiparsky, to appear); the speaker of

(12) The simian usher grunted that all the seats were taken.

is not committed to the belief that all the seats were taken, and

(13) *He howled Joan's eagerness to eat peanuts.

is ungrammatical, because the Poss-ing complement must be construed factively.

F. Manner-of-speaking verbs may be used parenthetically:

(14) The line, she { moaned / growled }, was busy.

Each of the properties A-F is shared by many verbs other than manner-of-speaking verbs, of course, and there is at least some degree of predictability among these properties. Thus, it appears that verbs that occur with significant direct quotations (i.e. quotations that report both the content and the form of the speech act; see Sadock 1969:316-324) as objects also occur with nonfactive that-clauses as objects. And, in general, verbs which take that-clause objects may be used parenthetically. In any event, it seems

likely that properties A through F either are consequents of the fact that manner-of-speaking verbs refer to intended acts of communication by speech and describe physical characteristics of these acts, or else are directly predictable from such consequents. The remaining properties are more opaque.

G. The direct object of a manner-of-speaking verb is deletable, and when such a verb occurs with no objects (direct or indirect), it is not necessarily interpreted as referring to an intended act of communication by speech; instead, it describes merely the physical characteristics of a sound. Thus,

(15) My companion { mumbled / shrieked / hollered / whined / hooted } .

does not imply that my companion made an attempt to convey information, only that he made a noise of some kind. Other verba dicenda are different: say, tell, and ask, for example, do not permit deletion of an indefinite object (when they occur without an object, the understood object must be supplied from the context), while speak, although it occurs freely without an object, takes only an extremely restricted class of objects (none of them desentential):

(16) I wondered who was coming, but no one { said / told (me) / asked } .

(17) Margaret spoke (to me).

(18) *Margaret spoke { that there were cockroaches in the caviar / how we could free her from the trap / for Pierre to fetch a nurse / Joan's eagerness to eat peanuts } .

H. A manner-of-speaking verb may also be interpreted non-communicatively when its object is a direct quotation:

(19) The neighbors { howled / moaned / wailed } "Futz".

However, the verb is interpreted communicatively if there is an indirect object, no matter what the nature of the direct object. Thus,

(20) ?She howled ({ "Futz" / something }) to me, but she wasn't saying anything to me.

seems contradictory. That is, properties G and H are exceptions to the general statement that manner-of-speaking verbs are interpreted communicatively. Two classes of apparent, rather than real, exceptions are discussed in I and K below.

I. A manner-of-speaking verb may occur with certain directional adverbials, some of which closely resemble indirect object clauses and are mutually exclusive with them:

(21) Our guide { whispered / moaned / hollered } in our direction.

(22) He { wailed / bellowed / mumbled } at us (*to Sam).

Inasmuch as these adverbials are not indirect objects, the verb may be interpreted noncommunicatively in their presence; compare (20) with

(23) She howled ({ "Futz" / something }) at me, but she wasn't saying anything to me.

Note that most other verba dicenda fail to occur with at-phrases:

(24) *She { said / declared / related / remarked / alleged / claimed / reported } (something) at me.

The exceptions are few (lecture and declaim, for example).

J. To each manner-of-speaking verb there corresponds a homophonous nominal referring to the speech act independent of its communicative content.

(25) I heard a { mumble / mutter / bellow / shriek } .

(26) Ernest's { scream / whine / whisper } frightened me.

Note again that other verba dicenda have rather different properties. Many nouns are not homophonous with their verbs (speech from speak, tale from tell, declaration and allegation from declare and allege, etc.), and the verb-noun relationships are not so regular semantically as in the case of manner-of-speaking verbs (the noun say is not analogous to the noun scream, for instance).

K. The homophonous nominal occurs as a cognate object to its verb.

(27) The referee shrieked a shriek.

(28) I'm sure he will whisper a nearly inaudible whisper.

If cognate objects are derived transformationally from their verbs, then it should be possible to interpret these verbs noncommunicatively, and it is:

(29) Gilbert howled an awful howl (at us), but he wasn't saying anything to anyone.

L. The homophonous nominal occurs in the idiomatic construction give a _____, which acts as a punctual form of the verb.

(30) A large brown bear gave a { howl / hoot / moan / yell } .

The construction is somewhat less natural with manner-of-speaking verbs describing soft speech (whisper, lisp, mumble, for example).

M. A manner-of-speaking verb may occur with a prepositional phrase headed by about.

(31) After lunch the guests { shouted / growled / muttered } (to the waiter) about { the food / Mary's nakedness / how the meal was cooked / having no dessert } .

(32) I { whispered / shrieked / whined } { "Et tu, Brute" / something nasty } about the fact that there was a knife in my chest.

Although the facts about the interpretation of these phrases are not entirely clear to me, I believe that the following two observations are essentially correct: (a) if the object of about is a factive nominal, it is open to two interpretations--that the referent of the subject believes in the truth of the object clause, or that the speaker of the sentence believes in the truth of the object clause; (b) if the object of about is a subjectless gerundive, the understood subject is either the subject of the main sentence, the indirect object of the main sentence, the two conjoined, or a generic pronoun. The first observation is illustrated by

(33) Billy screamed (to Janet) about the police attacks on students.

which may report either a statement of Billy's in which he declared that the police attacked students, or a statement of Billy's about some event which is described by the speaker of (33) as a police attack on students. That is, (33) may illustrate the usual opacity of indirect discourse. With respect to the second observation, consider

(34) Billy screamed (to Janet) about going to Montreal.

In (34) what Billy screams about may be either his going to Montreal, or Janet's (or an unexpressed addressee's) going to Montreal, or their going there together, or the general prospect of going to Montreal, but not some specific third person's going there. These properties of manner-of-speaking verbs are the same as properties of the verba dicenda speak and say (something); compare

(35) Billy { spoke / said something } (to Janet) about the police attacks on students.

with (33), and

(36) Billy { spoke / said something } (to Janet) about going to Montreal.

with (34).

N. Of the desentential complements referred to in D above, the that-clauses and indirect questions are interpreted as reports of

assertions, while infinitival constructions are interpreted as reports of commands or requests. That is,

(37) Ann shrieked to George that there were Peruvians in the pantry.

is a report of Ann's saying something on the order of

(38) There are Peruvians in the pantry.

and

(39) Ann shrieked to George how many Peruvians were coming to the party.

is a report of Ann's saying something on the order of

(40) _____ Peruvians are coming to the party.

On the other hand,

(41) Ann shrieked to George to purge the Peruvians.

is a report of Ann's saying something on the order of

(42) Purge the Peruvians!

or

(43) You should purge the Peruvians.

Similarly,

(44) Ann howled to George for Alphonse to clean the cellar.

is a report of Ann's saying something on the order of

(45) Alphonse should clean the cellar.

The imperative nature of examples like (41) is indicated by the possibility of

(46) Ann whispered to George to please keep quiet.
(47) Alphonse hooted to Ann to stop giving orders or else.
(48) George growled to Alphonse to obey without fail.

with the imperative indicators please, or else, and without fail.

The full paradigm of infinitival complements to manner-of-speaking verbs is of some interest:

(49) X v-ed to Y for Z to y
(50) X v-ed for Z to y
(51) X v-ed to Y to y
(52) X v-ed to y

exemplified by

(53) Lily whined to Marlene for Nedra to keep quiet.
(54) Lily whined for Nedra to keep quiet.
(55) Lily whined to Marlene to keep quiet.
(56) Lily whined to keep quiet.

The points of special interest are that in (55), the understood subject of keep quiet is Marlene, and that in (55) and (56) the underlying subject of keep quiet must be distinct from Lily, as Perlmutter (1968, sec. 1.1) has observed. In fact, in my speech the possible understandings of (56) are quite restricted: the understood subject of keep quiet is either the speaker of (56), the address of (56), or some group of persons containing at least one of these, or the understood subject is a generic pronoun. One other verb of speech, say, has exactly these properties:

(57) Lily said to Marlene for Nedra to keep quiet.
(58) Lily said for Nedra to keep quiet.
(59) Lily said to Marlene to keep quiet.
(60) Lily said to keep quiet.

are construed in the same way as (53)-(56), respectively. In O through Q below I formulate these properties more generally.

O. The rule of EQUI-NP DELETION (for a recent discussion, see Postal 1970) applies to the subject of an imperative completely to a manner-of-speaking verb, when that subject is coreferential with the indirect object of the verb.

P. The subject of an imperative complement to a manner-of-speaking verb must be distinct from the subject of a verb.

Q. The subject of an imperative complement to a manner-of-speaking verb in an S may be deleted if it is (a) coreferential with the speaker of the S; (b) coreferential with the addressee of the S; or (c) generic. Thus, (56) may be understood as any one of the following:

(61) Lily whined for $\left\{\begin{matrix}\text{me}\\\text{us}\end{matrix}\right\}$ to keep quiet.
(62) Lily whined for you to keep quiet.
(63) Lily whined for people to keep quiet.

but not as

(64) Lily whined for George to keep quiet.

R. Another property that the manner-of-speaking verbs share with say (plus ask, tell and a few other verba dicenda) is that they are entirely acceptable when they precede their direct quotation objects, as in

(65) The umpire { shrieked / bellowed / said / told him } , "I disagree with you".

whereas many verba dicenda are less acceptable in this position than they are when they follow such objects:

(66) ?The umpire { lectured / insisted / indicated / revealed / reported / conceded / contended / uttered } , "I disagree with you".

(67) "I disagree with you", the umpire { lectured / insisted / indicated / reported } .

(68) "I disagree with you", { revealed / conceded / contended / uttered } the umpire.

Since the properties just discussed are peculiar to say and the manner-of-speaking verbs, it is worthwhile to point out a few more ways, S and T, in which say has characteristics not shared by any of the manner-of-speaking verbs.

S. No manner-of-speaking verb can be used performatively (Austin 1962; Ross, to appear; and Sadock 1969). That is, despite the acceptability of

(69) I say that gold is malleable.
(70) I tell you that Cincinnati will win.

the sentence in

(71) ?I { mumble / grunt / shriek } that Baltimore will win.

cannot be construed as constituting either an assertion that Baltimore will win. or a mumble/grunt/shriek to that effect. if indeed the sentences in (71) are grammatical at all.

T. A manner-of-speaking verb is passivizable when it is not understood communicatively, and only then:

(72) "Glop" was { screamed / hooted / bellowed } (at them) by the dean.

(73) *It was { howled / shouted / whined } by Morris that night was falling.

(74) *"Glop" was { mumbled / shrieked / growled } to us by an onlooker.

Say is acceptable (if somewhat stilted) in these contexts:

(75) It was said by Morris that night was falling.
(76) "Glop" was said to us by an onlooker.

The observations in A through T are actually more remarkable than might have appeared. For if you invent a verb, say greem, which refers to an intended act of communication by speech and describes the physical characteristics of the act (say a loud, hoarse quality), then you know that greem will have every one of the properties in A through T. It will be possible to greem (i.e. to speak loudly and hoarsely), to greem for someone to get you a glass of water, to greem to your sister about the price of doughnuts, to greem "Ecch" at your enemies, to have your greem frighten the baby, to greem to me that my examples are absurd, and to give a greem when you see the explanaton. That is, properties A-T are all systematically associated with the semantic representation of manner-of-speaking verbs. The question is: How?

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